CLINICAL MEDICINE AND SURGERY

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EDITORIAL

Charles-Gabriel Pravaz

Inventor of the Hypodermic Syringe

THE names of Ehrlich, Sir Almroth Wright, and Banting, to mention only three of the long list of men who have made outstanding contributions to the healing art during the past generation or two, are almost as well known to all physicians as are those of the members of their immediate families; but that of the man who made possible the therapeutic application of their discoveries is so unfamiliar that scarcely one medical man in ten can even call it to mind.

Guillaume Pravaz was a French physician, who spent a long and honorable career in the practice of his profession in the picturesque little village of Pont-de-Beauvoisin, near the border of Savoy.

In the midst of the French Revolution, on March 24, 1791, a son was born to him, and they called the boy Charles-Gabriel. When he was old enough, his father taught him the rudiments of Latin, and then turned his education over to two uncles, who were priests.

The aptitudes of the young man did not, however, turn to medicine (to the disappointment of his father), but to mathematics, and he took up his studies along that line at Grenoble, where he lived like a recluse and made such remarkable progress that, a few years after, he was called to the chair of mathematics in the college of his native village, and later entered the Polytechnic School with a high rank.

When the allied forces which defeated Napolean first invaded France, in 1814, young Charles-Gabriel became a member of the battalion of the School, and fought so bravely at the barrier of Clichy that he was mentioned in orders. Later he was taken prisoner, but after Fontainebleau he was released and returned home.

The sights he saw during his military career, added to the fact that his mother was an invalid, convinced him that his basic impulse was toward curing men rather than killing them, and he matriculated with the Faculty of Medicine of Paris, supporting himself by tutoring in mathematics. In 1824, at the age of thirty-three years, he was graduated, and his thesis on "Phthisis of the Larynx" (the disease from which his mother suffered) was so masterly a production that Trousseau quoted it frequently.

He established himself in Paris, and not having a large practice, he accepted, in 1825, the post of physician to a hospital for old men, where he worked for ten years, during which time he married a woman who was the director of an important school for girls.

Observing, among his wife's pupils, the frequency of scoliosis, Pravaz decided to give up general practice and devote himself to orthopedics. In this field, though he worked before the days of anesthetics, he made a name for himself. His method for reduction

of congenital dislocation of the hip gained him a prize from the Institute and the cross of the Legion of Honor.

But the great contribution of Pravaz, and the basis of his fame, was the invention of the hypodermic syringe. He was working at the time on the cure of aneurysms, and made many laboratory and clinical experiments with coagulating the contents of the sac by means of electrical currents. He also conceived the idea of injecting a few drops of solution of perchloride of iron into the aneurysmal sac, by means of a hollow needle, and set about devising an apparatus for this purpose.

His first hypodermic syringe and needles were made by Charrière, about 1852, using silver, because it would not be attached by ordinary medicaments. The shank of the piston was threaded, so as to make it possible to give the exact dose desired without the possibility of injecting too much. Later he put through the shank a ring or spur, which still may be seen on some old syringes, as an atavistic remnant, whose use has disappeared.

The earliest syringes were accompanied by a number of accessories; and the needles were really fine trocars, with a sharp-pointed stylet. The name of the worker who conceived the idea of putting a bevel on the cannula and doing away with the stylet is unknown, but this procedure made possible the use of much finer needles.

Intravenous injections and blood transfusions had been practiced as early as 1667, but it was Pravaz who first made possible the introduction of medicaments under the skin and into the muscles, as well as making intravenous injections much simpler and safer, and thus laid the foundation for the whole magnificent structure of modern parenteral therapy, whose importance cannot be overestimated.

In Lyons, where his principal orthopedic hospital was located, a street has been named after him; and a monument was erected to him in his native village. Every time a physician or surgeon takes up his hypodermic syringe, it should be to him as a monument to Pravaz, who opened the way for some of the most remarkable achievements in experimental and clinical medicine.

Every now and then a man's mind is stretched by a new idea, and never shrinks back to its former dimensions.—Oliver Wendell Holmes, M.D.

Prohibition of knowledge is evil; the use to which that knowledge may be put is for the individual conscience.—Dr. Charles E. Farr.

Sleep

FEW people (even relatively few physicians) fully realize how vitally necessary sleep is to the animal economy, including that of human beings. Puppies, kept constantly awake, will die after five days, even though eating regularly; but can survive for twenty days without food, if they are allowed to sleep as much as they like. The brain is too delicate a mechanism to work continuously for long periods.

The newborn infant sleeps almost twenty-four hours a day, and the duration of necessary sleep slowly and steadily declines until, at the age of about fifteen years, the adult level of about eight hours is reached. It is recorded that Napolean and Edison could function satisfactorily with only about four hours of sleep out of twenty-four, but few are in that class and most people need from six to eight hours of sleep a day to retain their health.

It is a general belief that women and elderly persons need less sleep than do men in the prime of life, but there is no fixed standard in this matter and the only way to determine the individual requirement is by means of carefully and intelligently conducted experiments. When that requirement is once established, it should be adhered to faithfully.

The withdrawal of physical sensations is always an important factor in the onset of sleep, so quietness, darkness, muscular relaxation, a neutral temperature of the body, and the presence of fresh air are always matters to be considered and adjusted.

Habit, too, is a large factor, involving, psychologically, the engaging of consciousness, even by the *cessation* of physical sensation, as when the city man, who has learned to sleep in the midst of noise, is kept awake by the stillness of the country. The habit of going to sleep at will can be acquired by anyone who will make the necessary *persistent* effort to do so, and is so valuable that such effort is well repaid.

Sleep is deepest during the first two hours, and gradually becomes less profound until the moment of natural waking. This has led to the superstition that "one hour of sleep before midnight is worth two after." As a matter of fact, the morning sleep is just as refreshing as the deeper sleep that precedes it.

Physical fatigue generally leads to sleep, but if it is extreme it may cause insomnia. Mental fatigue, on the other hand, is one of

the greatest foes to sleep, because it is the result, not of thought, but of that chronic fear which we call worry and which is so difficult for most people to shake off.

Insomnia, in reasonably healthy people, is generally the result of an ill-adjusted and unhealthful way of life, and will cease with the correction of hygienic irregularities. With sick people, however, this is not the case, and the impediments to sleep must be removed by the physician, for the sick man needs even more sleep than he does when in health. Moreover, frail and elderly persons need all their energy, so their beds should be warmed, in cold weather, before they get into them, so that they may not waste that energy in warming a cold bed by body heat.

If the *habit* of sleep is broken by illness or emotional stress, it can frequently be restored by the administration, for a few nights, of a safe and effective hypnotic, and this should be done; but the emotionally unstable individual should not be encouraged to resort to these drugs as an escape from the pressure of his environment.

Every physician should study the sleep habits and requirements of his patients, bearing in mind the tremendous importance of this periodic cessation from cerebral activity, and should fit himself to give sound and helpful advice, to the sick and the well, so that sleep may not desert their pillows and expose them to a long list of physical and psychic ills which are wholly unnecessary and wholly avoidable, in the vast majority of cases.

Neurotics are made, not born.—Dr. J. R. Rees.

Syphilis in Rural Districts

THE new Surgeon General of the U. S. Public Health Service, Dr. Thomas Parran, who was introduced to our readers in our recent June issue, is a syphilogist of parts, and purposes to popularize the name of this disease so that it will be as freely discussed as are tuberculosis and appendicitis. Only then will we be really on the way to its control and final eradication.

There is a popular impression, even among physicians, that syphilis is decidedly more prevalent in the larger cities than it is in the smaller towns and rural districts; but some recent studies by the County Health Officer of Worcester County, Maryland (reported in *Venereal Disease Information*, June, 1936) indicate that this idea is a mistaken one, and that the reason why the reported rate in the country is lower than that in the cities is the fact that rural physicians are not keen about making the diagnosis nor dependable in reporting the cases diagnosed.

Dr. Bradford Massey organized two clinics in small towns in his rural county, where anyone applying for it would be given a diagnostic test, and where syphilitic patients, referred by physicians as being indigent, could be treated free.

The results of this rather modest activity were startling. The number of white people tested was small, but about 20 percent of both males and females of all ages gave positive Wassermann reactions. Colored males of all ages showed 41 percent positive (between 14 and 40 years, 48 percent), while colored females of all ages gave nearly 50 percent positive (between 14 and 40 years, 60 percent). Perhaps that is the reason why the stillbirth and infant death rates in that county have been so alarmingly high, especially in the colored families.

Another interesting feature of this clinic activity was the remarkable increase in the number of cases of syphilis reported by the physicians. During the years from 1930 to 1933, only 123 cases were reported from Worcester County during that entire period; but during the first year of the operation of the clinics, 260 cases were reported.

If this is a fair sample of conditions all over the country (and it probably is not far out of line), it is high time that the physicians in the smaller towns and rural districts awakened to their responsibility in connection with this devastating disease and bestirred themselves to do something about it.

Above all, for the sake of the oncoming generation, it is important that every pregnant woman, no matter what her social or economic status may be, should be suspected of being syphilitic until a searching clinical examination and repeated Wassermann tests have proved the contrary. If a pregnant woman is found to be infected, she should be given vigorous and thorough antisyphilitic treatment at the earliest possible moment.

Until the physicians of the United States face the facts in regard to syphilis and cooperate actively and continuously in discovering and treating these patients and in tracing and eliminating sources of infection, they remain open to the charge that they are derelict in their duty to their communities and to the nation.

The Umbilical Cord ("P.O.U.") Hormone

IN the March, 1934, issue of this Journal, on page 126, we published an article by Dr. Ishihara, of Japan, dealing with the use (chiefly parenterally) of a hormone, extracted from the placenta, ovaries, and umbilical cord (the "P.O.U. Hormone"), in the treatment of cancer, especially malignant neoplasms of the uterus.

This article aroused a good deal of interest among our readers, and many requests were made for information as to where this hormone could be obtained. Unfortunately, up to now, it has been prepared and marketed only in Japan, and at the time the article appeared and for some time thereafter, it was impossible to import it into this country, even for experimental purposes in recognized cancer clinics.

This prohibition has now been, in part, removed, so that tumor clinics and recognized oncologists who are carrying on research work can procure this material under certain necessary restrictions. Even general practitioners who have cancer patients under treatment can import it for purely experimental purposes, with the expressed understanding that they will not use it for the general treatment of malignant diseases nor set themselves up as "cancer specialists" and engage in quackery.

If any of our readers are seriously interested in testing this product, and are prepared to keep careful records of all cases so treated and report their results in due time, we will be glad to give them the information necessary to enable them to arrange for the importation of reasonable quantities of P.O.U. hormone, and suggestions as to the best ways of making helpful use of it.

NEXT MONTH

Dr. Charles J. Drueck, of Chicago, will offer a highly practical discussion of the important symptom, bleeding from the anus.

Dr. Winfield Scott Pugh, of New York City, will consider the etiology, symptoms and management of perinephritic abscesses in children.

Dr. John Boggess, of Guntersville, Ala., will present his theory of metabolic phosphorus poisoning.

The second and final part of Dr. Geschickter's article on tumors of the nervous system will appear.

COMING SOON

"Physical Methods in Nasal Disorders," by George A. Remington, M.D., Chicago.

"Short-Wave and Ultra-Short-Wave Therapy in the United States," by David H. Kling, M.D., Los Angeles, Calif.

Rearrangements

WITH the taking over of *The American Journal of Physical and Ambulant Therapy* and its incorporation in our reorganized Department of *Physical and Office Therapy and Radiology*, that Department will need more space, and we intend that it shall have it.

Dr. William A. Hinckle, who has been associate editor of our Department of *Proctology* since its inception, feels that the pressure of his other personal and professional affairs will not permit him to continue his editorial duties.

This, therefore, seems to be an appropriate time to discontinue the segregation of proctologic information in a separate department; which does *not* mean that we have lost interest in the important subject of rectal diseases, but merely that articles and abstracts dealing with that subject will appear elsewhere in our pages.

Hereafter all material dealing with the *office* treatment of rectal diseases will appear in the Department of "P. and O. T. and R.," while more general articles will be published with the other leading articles and abstracts.

Today, office practice is of more pressing importance to physicians than it has ever been before, because, to the extent to which it is soundly developed, the cost of treatment to patients will be greatly reduced by the elimination of hospital expenses, and the self-reliance of medical men will be enhanced.

We shall welcome constructive suggestions and hearty cooperation from our readers in making this important reorganized Department the *real help* to them which it can be made.

LEADING ARTICLES

Pharmacodynamics of Drugs Used Parenterally*

By Walton Forest Dutton, M.D., Amarillo, Texas

THE pharmacodynamics of drugs used parenterally is a subject of much importance. Few therapists have given the attention to pharmacodynamic studies that they deserve. The medical schools of the United States are inadequate in the teaching of pharmacotherapeutics, which accounts for the gross ignorance among physicians as to the physiologic and therapeutic effects of drugs. Solis Cohen, Abel, and Macht have been the leaders in teaching pharmacotherapeutics during the past quarter of a century, and deserve great credit for their eminent service to the medical profession.

The physiologic working of every important drug, or its pharmacodynamics, is a most complicated subject, knowledge of which cannot be acquired by cursory study. The sincere student of pharmacology must compare the complex interaction of several sets of factors. Four of these are essential to a comprehensive understanding of pharmacodynamics: (1) The agent or drug itself; (2) the organism or subject acted upon by the drug; (3) the various external agencies influencing the action of the drug on the organism; (4) the element of time.

It is obvious that the different physical, chemical and pharmacologic properties of the drug itself are of paramount importance in determining its physiologic effects. Chemicals vary as to their poisonous action. They must be studied, not only as to quality, but also as to quantity or dose, concentration, physical form (whether solid, liquid or gaseous), solubility, penetrative properties, method of administration, and numerous other properties.

Sulphuric acid is a powerful corrosive and destructive agent for all living tissue; yet, in dilute form, may be given by mouth and produce beneficial effects. Magnesium sulphate, administered by the stomach, is a useful saline purgative; given by intravenous injection, the characteristic paralyzing action of the magnesium is disseminated, producing powerful depression of the central nervous system, and, if not in proper dose, even death.

*Adapted, in part, from a chapter of "Parenteral Therapy" (Dutton and Lake), by permission of Charles C Thomas, Publisher.

The organism, or subject to which a given drug is administered or applied, must always be considered when pharmacodynamics is scientifically investigated. The data accrued from the study of any given drug on one kind of animal cannot, without reservation, be applied to other animals. Aside from the dose, different kinds of animals react differently to the same pharmacologic agents, and also various species of the same family show marked differences in this respect. A rat will not react in exactly the same way to morphine as will a mouse.

A large number of external factors must always be taken into consideration when analyzing the action of a given drug or medicinal substance. Some drugs are more potent in the presence of ultraviolet rays than in the dark. Temperature is of great importance in connection with drug action, the effect of most drugs being much more intense at higher than at lower temperatures.

The atmospheric pressure may play an important part in medicine and toxicology, especially in regard to the effects on the blood.

The Time Element

The importance of the time element in connection with the action of drugs is fundamental. Thus the question of time when a drug should be given to produce a specified result is, of course, implied by the practice of all those using drugs. A striking illustration of the importance of time is in the administration of quinine in malaria. In order to obtain the most efficient therapeutic results, the alkaloid should be given at a definite period of time in relation to the development of plasmodia in the blood.

The frequency of administration of a drug is another time element of importance in drug action. Drugs taken into the living organism may be rapidly oxidized or destroyed in other ways by the various organs of the body, or they may be stored in its tissues or eliminated through the secretions and excretions. The rapidity of destruction of a given drug determines the frequency with which it may be administered.

The speed or rapidity of administering drugs may mean the difference between life and death. This is particularly applicable to

intravenous medicaments. Whenever drugs are to be administered intravenously, the greatest care must be observed in regard to the use of a sufficiently diluted solution, and particularly in regard to the speed of infusion. Any drug having ions that are depressive to the heart muscle, will, in sufficient concentration, produce immediate arrest of the heart beat, and death. Such drugs as solutions of potassium iodide, quinine, sodium salicylate, and arsphenamine must be very dilute and injected very slowly.

A time factor which ought to be observed in therapeutics is the period of latency or incubation. In case of many drugs, such a period is required. This is especially true of biologicals, such as antitoxins, toxins and vaccines, but is also noted with many other drugs.

Again, sensitization instead of incubation may mark the action of other drugs. Repeated doses of strychnine make the organism more susceptible to its effect.

Another important factor which has to do with time, to be considered with the action of drugs, is the difference between their acute and chronic effects. Drugs administered in large quantities at one time, by mouth or parenterally, generally produce an acute pharmacologic effect which is not the same as the effect obtained from repeated administration of small doses of the same substances. In order to illustrate, various mercurials, or other medicaments, when given in large doses intravenously, may kill in a short time from paralysis of the heart; whereas, when given in small doses, they produce death generally through nephritis or inflammation of the kidneys.

In discussing the element of time, age should be seriously considered, and that in a twofold sense; namely, age as affecting the drug or medicinal agent, and age as affecting the organism or patient. Reactions to drugs may depend on the age of the patient, aside from size or weight. The dose of a certain medicament for children should be adjusted according to Young's or Cowling's rule, both of which are really dependent on the relative weight of the child, as compared with the weight of the average adult.

Human beings at different periods of life will react differently to certain drugs. Infants are more susceptible to the poisonous effects of opiates than are adults, apart from the relative sizes of the two patients. The reaction of belladonna alkaloids in children is quite different from that in senile patients. Adrenalin must be administered to old people with the greatest caution; and the same applies to a number of other drugs.

The aging of a drug is of the greatest importance wherever results are to be obtained. Many medicinal substances do not keep well. Ergot, for instance, deteriorates rapidly, even when kept in sealed containers.

Synergism

In a discussion of the time element and drugs, the subject would not be complete without touching upon the most remarkable, as well as the most important, phenomenon of synergism. Synergism deals with the pharmacologic reaction produced by the synchronous or simultaneous administration of two or more drugs.

When two or more drugs are administered or applied to living organisms, the effect may be an additive one or a simple arithmetical summation of the two component effects, on the one hand, or it may be a synergistic one, on the other. The latter term implies that one drug may potentiate or increase the action of the other in such a way that an entirely new and unexpected pharmacologic reaction is induced.

To illustrate, when small doses of morphine and scopolamine are administered together, the two drugs act synergistically or potentiate the effect of each other so as to produce a state of deep narcosis, which cannot be induced by even larger doses of either drug separately. Synergistic phenomena are so intimately bound up with the time element, in connection with the compounding, prescribing and administration of drugs, that they are of vital importance.

The general condition of the individual patient should be given consideration. Special knowledge of the chemistry of the blood, of its viscosity, and of the relative function of the emunctories is essential.

When the medicament has been selected, attention is turned to the technic of its application.

Technics

Parenteral methods of administration of drugs present certain peculiarities in the route taken to the heart after absorption and in changes undergone on the way. A thorough knowledge of the pharmacodynamic action is not only essential, but imperative to successful therapy.

The amazing lack of knowledge and uniformity in the preparation and sterilization of drugs used for parenteral administration is responsible for many disastrous results. This is evident in the many accidents occurring in connection with intradermal, subcutaneous, intramuscular, and intravenous injections.

Parenteral administration may be accomplished (1) without, or (2) with penetration of the tissues by a needle, or (3) via the lungs, by inhalation or injection. Medicaments may be introduced parenterally without penetration (a) upon accessible mucous membranes (eyes, ears, nose, tongue, throat, bronchi) for direct absorption, by the same

methods (emplacement, instillation, use of syringes and cannulas) as are used in local applications; (b) through the skin, commonly by inunction, sometimes by ionization.

Penetrating injections are made: (a) within the substance of the skin (intracutaneously); (b) in the lymph spaces under the skin (subcutaneously or hypodermically); (c) into the muscular tissues and lymph spaces (intramuscularly); (d) into the blood by way of the vein (intravenously), or, occasionally, of an artery (intra-arterially); (e) into the serous sacs (intrapleurally, intrapericardially, intraperitoneally); or (f) into the spinal canal, cisterna magna, ventricles of the brain, or (in infants) the longitudinal sinus, through the anterior fontanel. Injections are made also into the tissues of organs (intraparenchymally); and, in certain emergencies, into the heart muscle or cavities (intracardially).

Intracutaneous injections, much utilized for diagnostic purposes (Schick, Dick, luetin, and allergic tests) and for Jennerian vaccination, are employed in the treatment of infectious conditions of the skin, mucous membranes and joints. Soluble substances injected under the skin are absorbed very quickly, commonly in much less than half the time required when they are given by mouth.

Intramuscular injections stand, as regards rapidity of absorption, between subcutaneous and intravenous injections. Medicaments injected into a vein may pass through the right heart, the lungs, the left heart, and be distributed throughout the arterial circulation in about twenty seconds.

Preparations

For injection under the skin or into a muscle or vein, only medicaments soluble in water with an alkaline or very slightly acid reaction and which do not tend to form insoluble compounds with tissue or plasma constituents should, as a rule, be chosen. The volume of fluid which can be conveniently injected subcutaneously (except in hypodermoclysis) is small (not more than 2 to 5 cc.), hence drugs active in small dose, as the soluble alkaloidal salts, are applicable. No such limitation applies to intravenous infusions, if administered sufficiently slowly. The method is thus available for any non-irritant, non-coagulant drug in perfect solution, from 10 to 250 cc. being the common range limit. The organic arsenicals, certain iron compounds, sodium salicylate, sodium iodide, quinine salts, serums and antibodies are some of the many types of active medicaments so given; while intravenous injections of physiologic salt solution, dextrose, sodium citrate, weak alkalies, etc., or transfusions of blood, may be of 500 to 4000 cc., depending upon the requirement.

Diffusible agents which are insoluble in water, such as camphor, may be dissolved in a vegetable oil and injected under the skin or into a muscle. Intravenous injections of oils are absolutely contraindicated, on account of the danger of embolism. Mineral oils, which are not absorbed may, by blocking of the local lymph vessels, induce a condition like elephantiasis. Oily suspensions of insoluble agents, such as bismuth and mercurials, when injected into muscles, are very slowly absorbed and must be used with caution. More or less permanent compounds with proteins are formed, and not only may considerable local injury be done, but there is danger of systemic poisoning from the sudden release of a toxic quantity after long retention.

The maximum tolerated hydrogen ion range (pH 7.0 to 7.8) should be the deadline, even for one possessed only of an elementary knowledge of biochemistry; yet there are many who go beyond the extreme normal limit without consideration for the dictates of scientific acumen. If the subject survives, the Lord is merciful, and the patient ungodly tough.

Some aver that the buffers of the blood will take care of such marked deviations from normal. We must consider, however, that our therapy is directed at an abnormal condition, and not at the normal. Such is, or should be, our logical approach. The buffers of the blood, being salts of weak acids, are able to take up limited amounts of acid with much less change in hydrogen ion concentration than would result from the same addition of acid to water or sodium chloride solution, which have no buffer power. But the buffer systems may shift their ratios, and then difficulty arises. These buffer systems act, therefore, as reservoirs of alkali for the neutralization of the acid end-products of metabolism. Any marked deviation in the metabolic process will cause a deviation of the hydrogen ion concentration in a direct ratio.

All other factors of drug influence should receive careful consideration. A knowledge of the sources, preparation and therapeutic use of drugs is essential to the successful application of parenteral therapy.

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POSITION AND OUTLOOK

Vultures soar high, but their entire attention is fixed upon masses of carrion on the earth's surface.—SHRI RAMAKRISHNA.

Refinements in Equipment for Parenteral Medication

By Oscar Schwidetzky, Rutherford, N. J.

Manager, Research Department, Becton, Dickinson & Co.

WITH the beginning of the nineteenth century, the first attempts were made to utilize an opening through the skin as a medium for the introduction of remedies. In 1836, Dr. Lafargue, of France, invented a needle-trocar for depositing morphine in paste form. Up to that time, such drugs as were given parenterally were rubbed into a previously-made incision. In 1856, Dr. Fordyce Barker, of New York, while in Edinburgh, was presented with a Ferguson syringe, and from this model Geo. Tiemann & Co., of New York, produced the first hypodermic syringes that were made in the United States. From then on, parenteral therapy made rapid strides, and now occupies the most outstanding position in the treatment of disease.

Fig. 1.—Hypodermic Needle Point.*

The most important instrument in parenteral therapy is the hypodermic needle. A properly-made needle should have a sharp point, flexibility, strength, resistance against breakage, and, if desired, resistance against rust.

Hypodermic needles are the only sharp instruments used on the conscious patient. To minimize pain and trauma while inserting the needle, and to prevent unnecessary seepage and after-pain in intravenous, subcutaneous, and intramuscular injections, the shape of the needle point is of the utmost importance (see Fig. 1).

The proper needle point should be practically straight, thus eliminating the abrupt shoulder. The heel of the bevel, where the grinding starts, should be flat for about half the length of the bevel. This prevents catching and punching of the tissue or vein wall when the needle is inserted. The remaining half of the point should have both sides somewhat beveled, similar to a surgeon's needle.

The thickest and highest point should be in line with the bore. This greatly strengthens the point and practically eliminates buckling and curling of the point in intramuscular injections. A point of this construction enters the tissue and vein easily, but prevents extreme cutting, and hinders seepage along the needle when making an intramuscular injection, and also when the needle is withdrawn in intravenous work.

The tendency among authorities is toward the use of finer needles, because they are less painful, there is less seepage, and injections are given more slowly. The size of needles for intravenous work varies between 25-gage, ¾-inch, and 22-gage, 1-inch, with a leaning toward the finer gage. The standard gage of needles for the gravity method is 20-gage, length 1 to 1-½ inch.

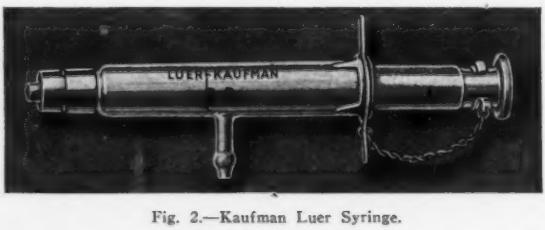

Fig. 2.—Kaufman Luer Syringe.

For intramuscular injections, 20-gage, 1-½-inch, and 19-gage, 2-inch needles are used; for spinal puncture, 19-gage, 3-½-inch; for spinal anesthesia, 20-gage, 3-½-inch, 22-gage, 3-inch, etc.

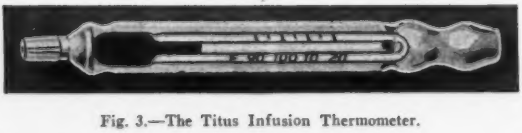

Fig. 3.—The Titus Infusion Thermometer.

For intravenous injections by the gravity method, the Kaufman Luer syringe (see Fig. 2), together with a 20-gage, 1-½-inch needle, is very useful. The danger of air entering the vein is eliminated and the operator has perfect control of the flow at all times. This syringe, with a 19-gage, 2-inch needle, is also very useful for continued phleboclysis.

Whenever it is necessary, in giving phleboclysis, to know the temperature of the so-

*All cuts furnished by courtesy of Becton, Dickinson & Co.

lution just before it enters the vein, the infusion thermometer designed by Dr. Titus is very valuable. The scale, 90° to 120° F., is engraved on the outside of the glass tube. Red pigment is burned in, and the Titus thermometer can be sterilized by either boiling or autoclaving. It is made either with a Luer slip, for direct fastening of the needle, or with a hose end (see Fig. 3).

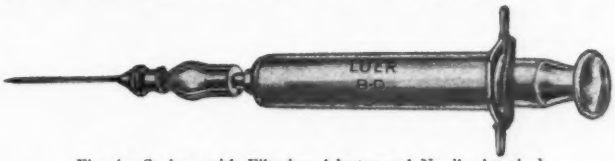

Fig. 4.—Syringe with Filtering Adapter and Needle Attached.

The late Dr. Jay F. Schamberg published, in July, 1922, an article in the *Journal of the American Medical Association*, describing a filtering adapter for filtering solutions while drawing them from the ampule into the syringe, and especially when using extemporaneous solutions of neoarsphenamine and other drugs (see Fig. 4). A pledget of gauze is placed in the filter and fragments of glass from breaking the ampule, or other possible solid matters, are thus filtered out. Such particles, while not large enough to be readily visible to the eye, may be of sufficient size to cause embolism in the minute capillaries of the lung, or possibly in other organs.

Fig. 5.—Syringe with Eccentric Tip, for Intravenous Injections.

A 17-gage needle, attached to the filter, is used for drawing the solution from the ampule. The filter and the large needle are removed as soon as the syringe is filled, and a suitable finer needle used for the injection.

A syringe with an eccentric tip (see Fig. 5) is of considerable advantage in intravenous work, because it allows the operator to rest the syringe on the arm of the patient while making the injection. This position is comfortable for the operator, steadies the syringe, and helps to keep the needle properly in the vein.

To make the Lindemann multiple-syringe method for blood transfusion more comfortable and easier for the operator, Dr. Houck constructed a special syringe (see Fig. 6) which, if used in connection with the Unger needle, eliminates the two most important shortcomings of the Lindeman syringe method: (1) Difficulties in holding the needle and syringe while withdrawing blood from the donor and injecting it into the recipient; (2) accidental withdrawal of the needle from the vein.

The Houck syringe has a capacity of 20 cc. The barrel has an extra-large and strong glass end, with a metal Luer slip and a special thumb-rest for comfortable holding of the needle and syringe.

The greatest drawback in the treatment of diabetes with insulin, encountered in private practice, is the necessity for the patient to administer this medication to himself, with a hypodermic needle and syringe. The instinct of self-preservation creates, in most human beings, a fear to inflict pain on themselves and a hesitancy to push the needle through the skin into the flesh. This hesitancy is increased by the fear of needle breakage, thus making the injection still more painful. Many a sufferer from diabetes struggles along on a rigid diet, to his own detriment and to the chagrin of his physician, simply because he lacks the will power necessary to overcome this natural inhibition.

Fig. 6.—Houck Syringe for Blood Transfusion.

To overcome this difficulty, the Busher automatic injector (see Fig. 7) has been devised. This device holds the syringe under tension by means of a spring. After the syringe has been filled with the required amount of insulin, it is drawn back and cocked. The injector is then placed firmly against the skin and, by touching a trigger, the needle is thrust through the skin, to the required depth and at the correct angle, with

Fig. 7.—The Busher Automatic Injector.

lightning rapidity and practically without pain or psychic shock.

Ever since Dr. C. G. Pravaz, of Lyons, France, employed for the first time a separate needle and syringe for hypodermic injection, attempts were made, by the medical profession and the instrument makers, to meet the need for a connection which would allow easy but secure fastening and easy unfastening of the needle and syringe; would also strengthen the rather fragile glass tip and lessen the danger of tip breakage; and which would not increase the cost of the needle and syringe. These attempts, however, long proved unsuccessful.

About 1925 the Luer-Lok tip was designed, and fulfilled all the requirements mentioned.

The illustration (Fig. 8) shows the Luer-Lok and the great difference in size between the ordinary glass Luer tip and the large, solid, glass tip used for it. Over this large tip the metal Luer-Lok is securely fastened, in such a way that the syringe can be sterilized by boiling or by autoclaving.

The metal Luer-Lok has an inside thread, which engages the rim of the needle hub and securely locks the needle to the syringe by a one-half turn to the right. No amount of pressure or manipulation of the needle and syringe will cause it to leak at the tip or to jump off. The needle, however, can be easily removed by a one-half turn to the left.

The bore of the metal Luer-Lok and of the large, glass tip is equal to the diameter of the largest needle used with each size of syringe. For instance, in all syringes from 20 cc. upward, the bore is larger than the inside of a 13-gage needle—a great help if syringes are used for aspiration.

The Luer-Lok feature is desirable for practically all needle and syringe work. It not only minimizes tip breakage, but also gives the doctor and nurse a feeling of confidence. The needle can be inserted more quickly, and therefore less painfully to the patient.

Practically all textbooks and articles written on local, spinal, and sacral anesthesia, intramuscular injections, proctology, varicose veins, aspirating, etc., recommend the Luer-Lok syringe, because it allows free manipulation of both needle and syringe, easy and fast detaching and attaching of the syringe and needle for refilling of syringe, and gives to the surgeon a feeling of confidence that the needle cannot jump off at the critical moment.

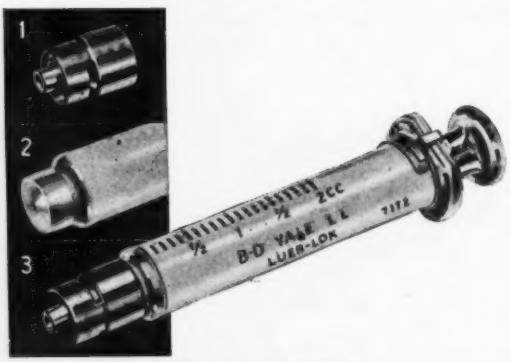

Fig. 8.—The Luer-Lok Syringe.

PACIFISTS

In general, when a pacifist is aggressively anti-aggressive, fanatically so, with overwhelming convictions as to the rightness of his theories, and in particular with a feeling of uplift and self-satisfaction in his work, we may suspect that he is in difficulty with his own instincts. He is still dealing with his own aggression by projection. He has an enemy to attack, but that enemy is now war. It is this type which is the greatest potential danger to society, for on the strength of his good faith he will expect to be excused scrutiny. Not only so, he will expect us to accept his panaceas as further evidence of virtue. And all the time he may be secretly driving himself and everyone else towards a war conflagration.—EDWARD GLOVER, *London, in* Character and Personality, *June, 1936.*

The Intravenous Use of Triple-Distilled Water

By J. L. Hanson, D.O., M.D., Philadelphia, Pa.

AS shown by clinical tests, based on careful consideration of the various disorders and the underlying pathology, covering a period of ten years, the ailments in which the intravenous use of triple-distilled water is of the most value are those in which the immunization factor can be called into play to antagonize the disease—toxemias of microorganismal, allergic, and metabolic origin. Especially is this true in the conditions in which organic lesions are absent or slight and where the process is non-virulent.

Chief among these are hay fever, pertussis, asthma, hyperesthetic rhinitis, influenza, pneumonia, seasickness, vomiting of pregnancy, carbuncles and boils, and arthritic and rheumatic conditions.

The method of employing the water injections is similar to that pursued when active immunity is aimed at through the use of vaccines, pollen extracts and the like, for the purpose of achieving immunity. In water injection, the agency is regarded as a device which, by effecting a rearrangement among the biochemical constituents within the blood, brings into play the forces which resist and offset the effects of the exciting substances or antigens which are operating in the economy. This rearrangement is effected principally by means of the osmotic phenomena occasioned, and is proportionate in amount with the size of the dose of water used.

Results of laboratory experiments support the idea that the intravenous injection of triple-distilled water enhances the formation of antibodies for abnormal substances or antigens, found within the economy or induced into it, but that it fails to do so when such substances are absent. Furthermore, since the amount of antibody formed when the triple-distilled water injections are employed exceeds that found when it is not employed, it is also indicated that its use is equivalent to or identical with reinoculation with the antigen in question, or autoinoculation.

General nor focal reaction does not take place except when excessive doses are employed. Therapeutic effects only follow proper doses. Beneficial action may be retarded or a negative phase established by severe intensification of symptoms.

The latter condition is likely to occur in cases of hay fever, neuralgia, severe cases of bronchial or cardiac asthma, far-advanced tuberculosis, and (exceptionally) late syphilis, if doses exceeding 1 to 1.5 cc. are given. Similarly, when doses exceeding 2 to 2.5 cc. are given, this same condition may be noticed in cases of neuritis, toxemia associated with goiter, severe toxemia and vomiting of pregnancy, hypertension in plethoric patients, influenza, and fever. In all other conditions doses not exceeding 3 to 5 cc. appear to be safe, but a total amount which exceeds 5 cc. within a week seems inadvisable in all conditions.

The interval in which complete successful reaction to the dose takes place is easily recognized in the conditions in which subjective symptoms are prominent. However, in these as well as in other conditions, weekly doses may be employed, exercising care that the reactive powers are not overburdened or overtaxed. The success of the method is dependent upon the correctness with which the size of the dose and the interval of administration are adjusted to the reactive powers of the organism in the pathologic condition in hand, whether simple or complex.

Water Injection As a Nonspecific Procedure

No appreciable reaction occurs at the site of the injection, because no febrile or other profound disturbance is invoked. Water injection may be employed in any disorder amenable to treatment by a nonspecific means, even though this disorder coexists with another, such as cardiac or vascular disease, pregnancy, or the like, which contraindicates the use of other agencies calling forth these reaction effects. The use of the nonprovocative dose, which is the one advised, permits the beneficial application of a nonspecific procedure to hay fever, asthma, and other sensitive conditions, in which the elicitation of decided intensification, difficult to avoid by other similar methods, may prove harmful and, for similar reasons, to the ailments associated with pregnancy, from the minor to the more profound disturbances. This agency is, moreover, available at all times and places.

Some interesting features of blood changes observed on the addition of triple-distilled water to blood in vitro, and on its intravenous injection in experimental subjects, are available. For these and, in fact, for the greater part of the development of this technic, the profession owes a debt of gratitude to William J. Schatz, M.D., of Allentown, Penna., who has been a pioneer in this study and whose teachings and advice made it possible for me to establish and carry on this technic. For the technical work, credit is due to Harry J. Krum, bacteriologist and chemist of the City of Allentown, Penna., and his assistant, Miss Ruth N. Hirsh, to both of whom I express my appreciation.

TABLE I

Effects Produced by Intravenous Injections on Human Subjects

Treatment	Before Injection			2 Hours After Injection			24 Hours After Injection		
	Red Cell Count (Millions)	Cell Volume (Hematocrit*)	Volume Index	Red Cell Count (Millions)	Cell Volume (Hematocrit)	Volume Index	Red Cell Count (Millions)	Cell Volume (Hematocrit)	Volume Index
Distilled Water in 2.5 cc. dose	4.510	47.0	1.042	4.790	46	0.960	4.790	48	1.005
	5.160	49.0	0.949	5.260	43	0.817	5.830	43	0.737
	4.300	47.5	1.104	4.900	46	0.938	5.350	45	0.810
	4.980	48.5	0.972	5.970	52	0.871	6.110	52	0.849
	4.690	46.0	0.980	4.803	45	0.931	4.710	39.5	0.847
	5.860	43.0	0.733	5.270	42	0.796	5.530	47	0.849
Average	4.917	46.8	0.963	5.170	45.6	0.8855	5.420	45.7	0.8495
Physiologic saline solution in 25 cc. dose	4.230	38.0	0.895	4.790	45	0.939	4.500	41	0.911
	4.840	47.0	0.971	3.640	45.5	1.250	4.980	44	0.833
	4.150	34.0	0.819	4.430	40	0.903	4.550	43	0.945
	5.690	49.25	0.865	5.180	47	0.907	5.620	46.25	0.822
	4.980	47.0	0.940	5.050	41	0.811	5.220	41	0.785
	4.530	21.0	0.463	5.390	33.5	0.763	4.880	35.5	0.802
Average	4.737	39.37	0.8255	4.580	42	0.9288	4.958	41.45	0.850

*Van Allen Hematocrit Tube, No. 3140.

As part of a series of complete experiments on various forms of injections on varying types of animals, Dr. Schatz and I made certain exhaustive tests on the effects of this procedure on human subjects. The purpose here was to determine whether or not the resulting volumetric changes in the red cells corresponded with those to be expected from the experimental results obtained in vitro, or whether or not the average volume of the cells increased after distilled water injections; remained the same after physiologic saline solution injections; and decreased after 15-percent sodium chloride solution injections. Another point to be investigated was whether or not the red-cell count and the changes in the volume of the cells bore any relation to each other. Table I shows the results of these experiments.

Volume index determinations, which of course necessitated red-cell counts, were made immediately before the first and only injection; two hours afterwards; and 24 hours afterwards. The results obtained showed the following:

1.—Whenever an increase in the red-cell count was noted, a decrease in the average volume of these cells (blood volume index) was observed, and vice versa.

2.—Physiologic saline solution is shown to be capable of bringing about decided changes in the red-cell count and in the blood volume index, which differ more or less diametrically from those brought about by the distilled water and 15-percent saline solution.

3.—The changes produced by distilled water and by 15-percent saline solution were, roughly speaking, in the same general direction. The primary response was shown to involve a decrease in the volume of the red cells following the use of triple-distilled water, which again tended to approach their former size; whereas, following the use of a 4 cc. dose of 15-percent saline solution, the size of the cells continued to decrease slightly.

4.—The results obtained in vitro indicate that the erythrocytes, when exposed to the action of triple-distilled water, resist destruction (demonstrable by enumeration), so long as the quality of water to which they are exposed does not approach in amount that of the blood; but notwithstanding this, red coloring matter is found in the supernatant fluid of the sedimented specimens of 1:700 distilled water and blood.

5.—The weight variations of the animals subjected to the intravenous injection of triple-distilled water in amounts up to 15 cc. per 2,000 grams of weight, were only slightly less than those of animals subjected to the saline solution.

6.—The erythrocyte counts of animals subjected to the intravenous injections of distilled water in doses of 20 cc. per 2,000 grams weight was increased or decreased at will by decreasing or increasing, respectively, the administration interval.

7.—Following the intravenous injection of the three agencies used here, an increased erythrocyte count was always associated with a decrease in the average volume of these cells, and vice versa.

8.—Intravenous injections of triple-distilled water and of 15-percent saline solution were each followed by changes in the average volume of the erythrocytes that were opposed to those following such injections of physiologic saline solution.

TABLE II

Doses and Results in Certain Diseases

No. of cases	Disease	Completely Benefited	Decidedly Benefited	Benefited	Average No. Doses	Average size of doses
74	*Asthma, Bronchial* (4)	14	33	27	20	1 to 4 cc.
6	*Bronchitis, chronic*	4	1	1	15	1 cc.
16	*Hay Fever*	5	8	3	10	5 cc.
33	*Nerve Pains* (Neuralgia and Neuritis)					
	4 *Tic Douloureux*	2	1	1	5	1 to 1.5 cc.
	2 Cervical	0	0	2	10	2 cc.
	16 *Brachial*	8	5	3	8	2.5 cc.
	4 *Facial*	3	1	0	4	1.5 cc.
	1 Intercostal	1	0	0	6	1.5 cc.
	6 *Sciatica*	3	1	2	5	2 cc.
14	Pertussis (5)	12	2	0	3	5 cc. (5)
3	Puerperal fever	0	3	0	2	3 cc. (6)
4	Pneumonia	0	3	1	2	2.5 cc.
4	Rheumatic fever	0	2	2	2	2.5 cc. (6)
8	*Rheumatism, chronic*	2	4	2	10	5 cc. (7)
8	*Scarlatina* (6)	0	8	0	2	2.5 cc. (5)
22	Skin conditions					
	12 Acne vulgaris	4	5	3	20	5 cc. (7)
	2 Herpes zoster	2	0	0	1.5	2.5 cc.
	4 Eczema in infant	3	1	0	15	5 cc. (8)
	2 Pemphigus in infant	0	2	0	2	5 cc. (8)
	2 Furunculosis in infant	0	2	0	2	5 cc. (8)
15	Vomiting of pregnancy	9	4	2	2	3.5 cc.

Note:—The names of those conditions in which others have also attained good results are printed in italics.

(4) With the removal of anatomic lesions, better results follow.
(5) The adult doses are stated here; when the patient was a child, the dose was adjusted accordingly.
(6) The symptoms disappeared more rapidly and the convalescence was established earlier than when the usual measures were employed alone. In these cases the injections were combined with the usual treatment.
(7) Smaller doses might give better results.
(8) Doses given the mothers, from whom the children were nursing.

9.—The variations in the coagulability of the blood following the intravenous injection of triple-distilled water and of physiologic saline solution were of such a character as to indicate that they occur independently of the agency or the dose used.

10.—No control value is attached to the saline solution applied intravenously.

In 86 of the cases appearing in Table II, and 12 others, apparently normal individuals, studied for comparison, the following was found:

1.—The coagulation time was almost invariably reduced within twenty-four hours after injection.

2.—Eosinophilia was either instituted or increased within the same period after the first injection, the average, however, being only 0.686 percent. Within 20 days after 3 injections the average increase was 5 percent. The other white cells showed nothing typical.

3.—The hemoglobin (Dale readings) was increased 2.65 percent within twenty-four hours after the first injection, and gradually increased to 5.3 percent within 20 days with 3 injections.

4.—The average red-cell count increased 113,480 within twenty-four hours after the first injection, and increased to 122,000, on the average, with 3 injections in 20 days. Only 3 cases in which the red-cell count decreased received substantial clinical benefit; others (18) showed doubtful results. Cases with a count below 3,000,000 received little or no benefit.

5. Exceptional results were noted as follows: In a hay fever case, eosinophilia increased from 1 percent to 18 percent in 15 days (14 percent within the last 6 days). In an apparently normal individual the hemoglobin increased from 80 percent to 104 percent within 16 days with 4 injections; in a hay fever case it decreased 15 percent, within 14 days with 4 injections. The red-cell count of a puerperal fever case, not in this series, increased from 3,000,000 to 5,100,000 within twenty-four hours after the second injection.

Technic

This procedure is carried out under usual surgical asepsis conditions. When possible, the median cephalic vein is the one of choice for the site of the injection. Great care must be taken to see that the needle is in the lumen of the vein. Pain, tumefaction or resistance to flow, indicates that the solution is not going into the vein. When one is in doubt, traction should be made on the piston; if blood enters the syringe freely, the needle is in the vein. Avoid administering the solution with too great speed.

The technic for the various diseases is

much the same. While the amount of the dose varies from 1.5 to 5 cc., dependent upon the ailment, these general facts apply to all forms of treatment under this procedure. In severe cases, the usual dose is 1.5 cc.; in moderately severe cases, 2.0 cc.

Following the injection and during the course of an attack, when distilled water is employed in the dose which experience has shown to be productive of results, no changes are noted, except a change in the direction of the symptomless condition.

There is no febrile reaction nor uncomfortable manifestation. The change in question may be one of a decisive character, or it may come very gradually, within a period of a few days. However, it usually occurs within a few hours. It may persist for a few days, for a week, or for a month or more, but its usual duration is a week. Patients who come for treatment for their first attack obtain a greater degree of relief, and permanent relief more frequently than others.

In a mild case, a dose of from 2 to 2.5 cc. usually brings a considerable degree of relief. A dose greater than this amount is followed by positive intensification of the symptoms. A dose of 5 cc. is followed by the most extreme manifestations of the symptoms.

Recent cases tolerate and require larger doses than those of longer standing. Children tolerate and require proportionally larger doses than adults. When, after an injection, the symptoms fail to decrease, it is safe to proceed on the basis that the dose employed was too small to do any noticeable good, and under these circumstances another injection may be given after an interval of not less than two days, but in no instance shall the amount of water injected within a week exceed 5 cc.

When it is desired to repeat a dose and the response has been beneficial, repetition may be practised according to several plans.

1.—Do not repeat as long as improvement is taking place.

2.—Note the number of days in which improvement takes place after the first dose, and then adopt this period as the administration interval.

3.—Weekly administration of nonprovocative doses are employed.

Under each plan the dose is to be increased or decreased as indicated by the needs.

The number of injections required to bring decided relief is about six, but many are immediately relieved by one or two.

Dose adaptation is simplified by regarding the severity of the symptoms as the index of the degree in which the reactive balance is available. When the symptoms are severe and the reactive balance accordingly small, minimum doses and consequently minimum inoculation effects are called for, and vice versa.

The outstanding features of this therapy are the simplicity of application, availability, effectiveness, and applicability during any stage of the attack, regardless of the severity of the symptoms.

To insure safety, triple-distilled water should be kept in an alkali-free glass container, with a rubber cap, permitting the introduction of the needle of the syringe to be filled. This is very essential if the maximum results are to be expected.

Many prominent physicians have joined in the development of this measure. Among these are Drs. J. Madison Taylor, Charles E. de M. Sajous (deceased), R. S. Dorsett, Theodore Le Boutillier (deceased), Asher Ruch, C. Hayden Phillips, and others.

Dr. Sajous explained the therapeutic value of triple-distilled water, when employed according to this method, as follows:

"The functions of the red corpuscles are commonly believed to be concerned only with the distribution of the oxygen in the tissues. Conversely, the presence, in the spongy stroma and other covering of these blood cells, of the lipoid rich in phosphorus, lecithin, and of the monatomic alcohol, cholesterol (which jointly constitute 30 percent of the dried stroma after the removal of the hemoglobin), is generally overlooked. And yet it is mainly these two bodies which tend to explain the therapeutic action of water employed in the manner described. Thus, mixtures of lecithin and cholesterin possess the remarkable property of taking up sufficiently large quantities of water to cause rupture of the corpuscles—a result favored by the familiar hemolytic role of distilled water—and thus allow the contents to pass out into the surrounding plasma. The venous blood, into which the distilled water is injected, finds itself, as a result of this phenomenon, charged with a quantity of free hemoglobin, lecithin, and cholesterin. On reaching the arterial blood stream, the emulsion thus formed increases its antitoxic and bactericidal properties for, as shown by Bang and Forsman, it is the corpuscular lipoid (lecithin) which fixes the ferment-like complement. This enables the latter, with the aid of the amboceptor, to submit the pathogenic elements which the blood contains, to an active and somewhat proteolytic process which converts them into eliminable end-products.

"In short, the distilled water causes: (1) An artificial hemolysis of a number of red corpuscles proportionate with the volume of water injected; and (2) the substances thus liberated into the plasma, reacting with others present or secreted therein by certain leukocytes, endow the blood with antitoxic and bactericidal, nonspecific properties.

"Conversely, indifferent or negative results were obtained in severe infections, in which the pyogenic organisms were of a virulent type—carbuncles, boils, tubercu-

losis, syphilis, etc.—because a sufficiently active reaction could not be provoked; also in organic functional diseases with destructive lesions—advanced tuberculosis, cancer, sarcoma, diabetes mellitus, etc.—for the same reason and owing to the lack of influence upon the lesion per se; also in toxic neuroses attended with trophic disturbances or changes—migraine, chorea, epilepsy, goiter, etc.—because of inability to influence these reactions.

"Reductions of coagulation time are due to liberation in the blood stream of prothrombin, from the ruptured red corpuscles.

"In the light of this interpretation it would seem that intravenous injections of distilled water are indicated in all uncomplicated toxemias or infections of a non-virulent type, to initiate and perpetuate, by repeated injections, a *sui generis* defensive process of a nonspecific type."

In conclusion, physicians of all schools have come to realize that they can no longer depend upon any single form of therapy as a curative agent, and as the medical profession has always stood for the truth whenever scientifically proved, my aim has been to give a fair and brief idea of the value of triple-distilled water injections, so far as the method has been elaborated, and to call forth helpful discussion. Each year of advance in the science of medicine and physical therapeutics brings more and more complex and elaborate problems, for every new instrumentality has brought with it new and finer and more delicate procedures.

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The Care of Hypodermic Needles

By Geo. C. Croston, M.D., Sapulpa, Okla.

SEVERAL years ago it occurred to me that there must be a simple and easy way to resharpen dull, blunted, and unusable hypodermic needles. I tried several ways, but all

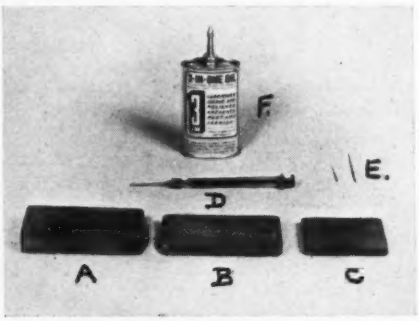


Fig. 1.

were unsatisfactory in properly restoring the needles.

For the past eight or ten years the method which I worked out has served me well and has been satisfactory to me in every way. Hence, being so well pleased with it, it gives me pleasure to pass the idea along to the other members of the profession who might see fit to adopt it and use it for their own economic benefit.

By this method one can sharpen a hypodermic needle, as it should be sharpened, in about one minute, after one acquires the technic or "hang" of it. One can also place on the needle any bevel desired.

In sharpening and treating needles, there are several things that one must keep in mind to rehabilitate them successfully, so that they will give satisfactory service at all times. These features are:

1.—The apex or point of the needle.

2.—The concave-convex edge on the side of the bevel.

3.—The distal opening.

4.—The lumen or barrel of the entire needle.

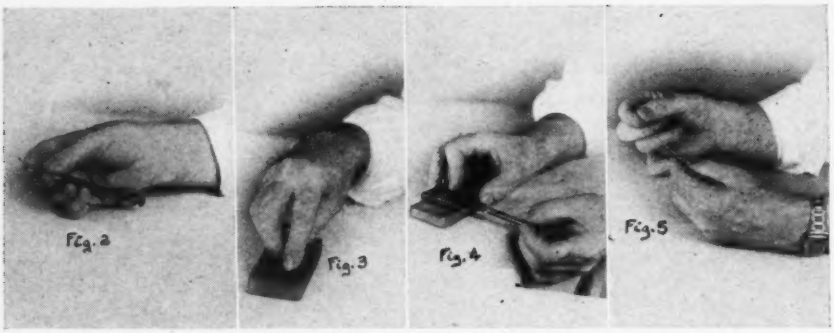
5.—The external surface of shaft of the needle.

6.—The vaginal portion of the shoulder of the needle.

The apparatus and paraphernalia necessary for such a procedure may be enumerated as follows:

1.—Three different grades of hones.
   A.—One carborundum hone, No. 124.
   B.—One stone hone.
   C.—One composition compressed hone.
2.—One tuberculin syringe.
3.—One can of 3-in-1 oil.
4.—Two or three different sizes of jeweler's cutting broaches.

These cutting broaches may be obtained from any jeweler. One must obtain the five-sided broach. I find numerous uses for them, principally for opening up occluded needles; for breaking off and filing the ragged edges



of the bevel part of the needle; and for polishing and cleaning the barrel of the needle on the inside, from the shoulder to the point. There are very few stopped-up needles that cannot be opened up with the use of these broaches and a little 3-in-1 oil.*

Fig. 1.—Shows the necessary apparatus: A, B, C, three different grades of hones; D, tuberculin syringe with needle attached; E, two different-sized broaches; F, can of 3-in-1 oil.

Fig. 2.—Shows the proper position to hold the tuberculin syringe and needle. Place the needle on the syringe very tightly, and place the center of the index fingernail on top of the needle just back of its bevel. This constitutes "landing point A." The thumbnail is "landing point B." The middle fingernail is "landing point C." The syringe is held fairly firmly with the ring and little finger. The needle and syringe, held in this position, afford a perfect three-point landing onto the hone. From 10 to 20 forward strokes on each hone, without changing the "stance," should give a perfect, level bevel that is sharp and cutting.

Fig. 3.—Shows the position of the hand holding the syringe and needle while making a three-point landing.

Fig. 4.—Shows the position of two hones, the syringe, and the needle when it is being brightened and polished on the outer surface of the shaft. A rotating motion is given to the needle by the left hand, and simultaneously a back-and forward motion by the right hand with the top hone. This removes all rough and slightly rusty places and makes the shaft bright, clean, and smooth, just like its original luster.

Fig. 5.—Shows the purpose of the broaches. The cutting end of the broach is dipped in oil and inserted into the lumen of the needle. With slight pressure and a rotary movement given to the broach with the fingers holding it, the most obstinate closed-up needles can readily and easily be freed, opened up, and restored to usefulness. I find that it is necessary to clean and brighten the inside of the needle with these broaches, so that the solutions being used will flow through more smoothly.

Conclusions

The proper use of a hypodermic needle is an art within itself.

If the needles are in the very best of usable condition, the art becomes easier.

A smooth and sharp-cutting needle gives but little pain when used.

The psychologic impression made upon the patient by the use of a good, sharp needle is all in favor of the physician.

Needles are better sterilized when properly taken care of, as described above.

*It is suggested that, before using a needle which has been reconditioned in this manner, it should be carefully tested to make sure that it has not been weakened, especially where the shaft joins the shoulder, so that it is liable to break in the tissues when used. In the case of ordinary hypodermic needles, which are relatively inexpensive, it would perhaps be better to discard them when they become unserviceable. It is well to examine the point of a reconditioned needle with a good magnifying glass, to make sure that there are no "fish-hooks" or other irregularities.—Ed.

INFLATION

Inflation on the grand scale is one of the greatest disasters which can overtake a people. It attacks the life of every man, woman, and child in the community, and it is practically impossible for the ordinary person to fight against it.—James Truslow Adams, in *Scribner's Magazine*.

Intracutaneous Injection of Vaccines

By Fred D. LaRochelle, M.D., Springfield, Mass.

THE human body is controlled by two well-defined nervous systems: the cerebrospinal system and the autonomic apparatus which, as its name suggests, is largely automatic. The fact that immunity processes were made evident by chemical methods has led to the coining of a multitude of words like opsonins, precipitins, agglutinins, etc. It should, however, be kept clearly in mind that immunity is a function of the autonomic nervous system, and that the various chemicals are but the agents of this mechanism.

Immunity is the resistance manifested by man and various animal species to pathogenic micro-organisms or other foreign proteins. Without the autonomic system there could be no immunity. In unicellular organisms there is a primitive mechanism that maintains a correlation of the various units composing the cell. In aggregations of cells, such as the human body, this correlative mechanism persists in the individual cells and expands its structure, as well as its function, into a distinct and separate system. In this system resides the inherited reaction patterns of the individual. The autonomic system within the body can only be reached through the endings in the skin and mucosa and the sense organs, which are but specialized skin and mucous membranes.

We can represent the autonomic system as consisting of a prevertebral chain of ganglia, in contact with the various organs of the body by a very large number of fibers, with a very much smaller number of fibers connecting the ganglia amongst themselves, and with a still smaller number of fibers connecting it with the cerebrospinal system. The importance of the autonomic system is made evident by the fact that it can maintain life in a decapitated animal.

There are two kinds of immunity, the natural and the acquired.

Natural Immunity

The natural, or spontaneous, or inherent resistance of the animal organism to disease is only relative, never absolute. The ability of animals to ward off disease varies with different species and among animals of the same family under normal conditions. An animal may manifest considerable resistance to infections; nevertheless, if the vital resistance be made to fall (that is, if the autonomic system is damaged or if the infectious agent is very virulent or exceeds the ability of the autonomic processes to protect themselves), the defences may crumble and disease result.

The inherent immunity of certain species to infections is remarkable. The negro is highly resistant to yellow fever, and most of the lower animals to venereal infections.

In order to produce infection, micro-organisms must first overcome the local barriers. If they are successful in doing this they then have to cope with the general processes. Local processes first take place in the skin and mucous membranes, while general processes are effected in the mesodermal tissues.

Certain tissues manifest a high tolerance to pathogenic micro-organisms. For example, the mouth, anterior urethra, and the vaginal tract normally harbor many different pathogenic bacteria without ill effect. If these same organisms are introduced through the skin, into the synovial sacs of joints, or into the peritoneal cavity, a severe infection will result. This indicates that the reaction patterns of the joint autonomic endings are different from the endings in the skin and mucous membranes. The intestinal tract harbors a large number of colon bacilli without ill effects, but if these same organisms gain access to the urinary tract they may cause most stubborn infections.

Infections common in warm-blooded animals are rare in the cold-blooded, and vice versa. Vertebrates and invertebrates are not subject to similar infections. Field mice are susceptible to glanders, while house mice are immune. Tuberculosis is more prevalent in Jersey than in Holstein cattle. Birds and reptiles are not necessarily subject to the same diseases that afflict man.

Acquired Immunity

Acquired immunity is that reaction pattern of the autonomic nervous system resulting after recovery from infections or arising by virtue of artificial inoculation. It may be produced in two ways: active or passive immunization.

Active immunization refers to that process by which the autonomic system of the animal is stimulated, by pathogenic organisms or their toxins or a foreign protein, to change its reaction patterns in such a manner that this agent is no longer able to gain a foothold in the body to produce derangements in its mechanism. These reaction patterns may be both specific and nonspecific. Since the animal organism is actively engaged in this process, we term it active.

Untreated disease due to infections terminates in one of three ways: in death, recovery, or chronicity. If the virulence of the infection is great and the dose large or overwhelming, or if the reaction pattern of the autonomic system of the animal is weak or

misdirected, the animal may succumb. If it is strong and well directed it may survive, even though the dose be large, but the recovery may be protracted. If the degree of virulence of the infection be merely average but the reaction pattern only mediocre, chronic invalidism may result. This reaction pattern may be reinforced by artificial inoculations employing homologous organisms.

When an individual recovers from an infection, it is evident that he either had an adequate reaction pattern of the autonomic system in the first place or developed one in time to save himself, and, as a rule, once developed, this reaction pattern will persist for some time afterwards, and this prevents new infections from the same organisms unless the vicissitudes of life call for new patterns that may be built up at the expense of the old ones more recently acquired. We can then understand how a new infection might destroy immunity to another infection or, in some cases, reinforce it. This explains how malaria reinforces immune processes against syphilis.

It can be demonstrated beyond any possibility of doubt that immunity against particular diseases can be acquired by artificial inoculations using the specific bacteria or viruses.

The methods by which immunity may be acquired through active immunization are as follows, enumerated in the order of their efficiency:

1.—Inoculation with virulent bacteria, such as the spirilla of asiatic cholera.

2.—Inoculation with attenuated or relatively avirulent micro-organisms. Anti-smallpox vaccination and anti-rabic inoculations are examples.

3.—Inoculation with dead bacteria, embracing the prevalent practice of vaccine therapy. Examples include vaccination against typhoid fever, plague, staphylococcus infections, etc.

4.—Inoculation with the products of excretion of bacteria. Tetanus and diphtheria toxoids are familiar examples.

5.—Inoculation with the disintegrated products of bacterial bodies. The disintegration may be effected by chemical or mechanical means.

Passive Immunization refers to the processes by which immunity is acquired when artificial anti-serums are injected into the animal body. Passive immunity does not premise any change in the reaction patterns of the autonomic nervous system of the animal protected, and hence is of short duration.

Immunity is, then, a manifestation of the activity of the autonomic nervous system. This system can maintain the animal in health under normal circumstances, and when it is deranged by the introduction of dead or living nocuous bodies, it changes its patterns to cope with the invader, as an army at peace reorients its activity in time of war. The war being over, the patterns may be put aside for further use, or allowed to rust, or may be used to evolve new ones, in which case the material and personnel may be put to new purposes.

Application of Bacterial Inoculations

When pathogenic organisms pass the skin or mucosa, they do two things: They effect changes in the autonomic nervous system patterns of a protective nature, and attend to their own economy by developing and multiplying and evolving specific toxic bodies. These specific toxic compounds exist in the bacterial bodies, as is demonstrated by the reactions to the products of their disintegration. Killing the bacteria before inoculation precludes their multiplication and leaves the host to cope with the toxic products only. This, then, is the basis of vaccine therapy.

Inoculated in suitable doses, dead bacteria will stimulate the autonomic system to develop reaction patterns that are beneficial to the host.

In using vaccines for the prevention and cure of infections, the physician should remember that these in no wise change the biologic processes of the bacteria responsible for the infection. It is the reaction patterns that do the work. Consequently the type of bacteria, the dose, and the frequency of inoculations should all be guided by the reactions induced.

In general it is admitted that the greatest and most lasting immunity is produced by inoculation with living bacteria. A person who has had typhoid fever, for example, will rarely suffer a new infection. The protective reaction pattern persists for life, but is not transmitted by heredity. In other words, the reaction patterns induced in the autonomic processes will persist during the lifetime of the individual and be adequate to destroy typhoid bacilli at once, if they are introduced into the body once more.

Immunity induced by inoculation with dead bacteria also brings about reaction patterns, but they are not so extensive nor so well correlated and consequently they will suffer changes with the vicissitudes of life and disappear in the course of time, to be replaced by new ones of more immediate benefit to the host.

Inoculation with the products of bacterial metabolism will also induce protective reaction patterns, but these patterns are primitive and of short duration.

Immunity is never absolute. The degree of immunity may be determined by cutaneous allergic tests and by serologic reactions.

Intracutaneous Inoculations

Bearing in mind that the autonomic endings are far most numerous and most highly developed in the skin and mucosa, and that what might be called natural infections always begin in them, it at once becomes apparent that it is in these structures that inoculations should be made.

When I was a student, I remember well the professor of pathology telling about the results with vaccines, which were then being introduced. He had noted that in some cases the results were brilliant, and in others nil. It was then generally believed that the difference was due to the vaccine, and since that time all manner of procedures have been evolved for the preparation of vaccines. One of these, which has achieved considerable favor of late, has been a filtrate, used in the treatment of gonococcus infections.

As soon as this was put on the market, I had occasion to treat several cases, and I was impressed with the results obtained when I followed the technic described for making intracutaneous injections. There was no doubt in my mind that the results were superior to anything I had seen, and the idea came to me that these results might be explained by the manner of making the injections, rather than by any peculiarity in the method of preparing the vaccine. Consequently I began to inject other vaccines *into*, rather than under, the skin, and the results seemed impressive. Added experience has about convinced me that injections made into the skin, which plays such a large rôle in autonomic processes, give far better results than when the injections are made in the rather indifferent (as far as the autonomic system is concerned) fatty subcutaneous tissues.

Presently I am using vaccines in the treatment of infections, and while I well know that it is difficult to evaluate such procedure, I am certainly of the opinion that progress has been achieved.

Technic

If others have had experience with inoculations into the skin, they must have noted the difficulty in making the injections. To obviate these difficulties I have evolved a technic by which these injections can be made with ease, without special equipment.

The directions for making intracutaneous injections, given by the makers of gonococcus filtrate, call for special needles, etc. In the technic I have developed, any fine hypodermic needle will do, regardless of the bevel of the point. An insulin or tuberculin syringe is most convenient, since it enables one to measure the dose more accurately.

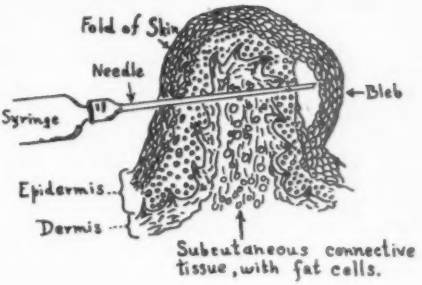


FIG. 1

Instead of entering the epiderm directly, I first pass the needle through a fold in the skin and enter the epiderm of the other side, from underneath (see Fig. 1). When the epiderm is entered in this manner, the fact can readily be recognized by the sense of touch and the point of the needle can be seen just beneath the superficial layers of epithelium. The injection is then made and a wheal results which is proportional to the quantity injected. As a rule, a wheal the size of a ten-cent piece is satisfactory. The injection may be made in the skin or mucosa, in any part of the body, by this technic.

How often should the inoculations be made?

I believe that small doses, repeated often, give the best results. As a rule, 0.20 to 0.40 cc. will give a sufficient reaction, and this may be repeated several times daily, according to the local and general reaction. In case the local reaction is too severe, it may be mitigated by the application of an ointment of phenol and ergot (Ergophen), which is readily available.

About the results: I have occasion to treat a number of cases of acute tonsillitis. Where it formerly took weeks to achieve resolutions, it is now a matter of days. Two or three inoculations are made daily, and if only one tonsil is involved when the patient is seen, the other will rarely be affected.

I have also treated several cases of ischiorectal abscesses in this manner, in addition to surgical drainage, and I am certainly under the impression that the results are definitely better.

Colds, both acute and chronic, seem to respond in a very gratifying manner, and chronic sinus infections are materially benefited if intracutaneous vaccine injections are combined with the usual local treatment.

To my way of thinking, intracutaneous vaccine injections, using small doses repeated frequently, appears to open a new era in vaccine therapy.

89 Belmont Ave.

Antibacterial Therapy with Edwenil

By Frank W. Porterfield, M.D., F.A.C.S., Waterloo, Ia.

MOST medical men, especially those in general practice, will agree that therapeutics has not kept pace with the remarkable advances that have been made in many other branches of our profession. It lags behind such fundamentals as anatomy, physiology, histology, and chemistry; while the advances in diagnosis, pathology, pediatrics, hygiene, surgery, and even that newer development, endocrinology, are all from fifteen to thirty years ahead of therapeutics, than which no other branch is of greater importance to physician and patient alike.

A few years ago, Dr. George Draper presented a paper before the New York State Medical Society, the opening paragraph of which was as follows:

"To every conscientious physician, there must come a time when he will wonder if his usefulness in his chosen profession, measured by his therapeutics, in any way justifies the lofty ambitions which led him to the doors of his medical school."

I have never forgotten this challenge to the status of conventional therapeutics, and Dr. Draper's criticism is as true today as when first made. The history of medical therapeutics is literally choked with hundreds of suggestions that have appeared in standard textbooks, in medical journals, and that even were taught in our medical schools, but which today are absolutely obsolete, and deservedly so.

If medicine ever becomes, not only a fine art, but also an exact science (which is the dream of every loyal and thinking physician), it will not be due alone to the labors of the research laboratories, nor to experimental studies, nor to the work of pharmaceutical chemists. Our profession will not take its place as a recognized member of the acknowledged sciences until its teachings are fortified and strengthened by actual clinical experiences of men of unquestioned integrity who are devoted to the welfare of their profession above everything else.

Hippocrates gave a piece of sound advice, which is as true today as it was nearly 2,400 years ago when uttered by the "Father of Medicine": "It is Nature that heals; all that the physician can do is to favor her." This contains an incontrovertible truth which every physician would do well to remember at every bedside to which he is called. We should pay attention to Nature, to her normal activities and defensive methods. By following them and by removing every factor that interferes with Nature's responses, we would afford her a better opportunity to heal our diseases.

Surely every physician will agree that it is his bounden duty to "preserve human life, at its longest and its best." But how may this be done? By the employment of every agency that gives demonstrable aid, regardless of its origin or authorship. Such agencies are built upon a framework of the physician's student years; of his books, and medical journals; and, more important than these, his own clinical experiences and those of his colleagues.

Reactions of Immunity

For some years I have been especially interested in current developments in immunology and body chemistry, first with bacterial vaccines, then with nonspecific proteins as suggested by Metchnikoff, plus chemical remineralization. More recently I have been favoring Nature in her antibacterial efforts with a comparatively new remedy called Edwenil.

It is said that nearly two-thirds of the diseases to which the flesh is heir are the result of infections and infestations. Hence it will be seen that the broad subject of immunology includes many matters that cannot be mentioned here. I wish, however, to present some ideas regarding the ordinary infections with the pyogenic organisms, together with some clinical experiences which, I trust, will confirm my belief that a worth-while contribution has been made to therapeutics.

First of all, we know that the body reacts in certain ways to bacterial invasions. These reactions vary with the nature of the infecting agent, as well as with the resilience or response capacity of the individual. Some types of bacteria, such as *Streptococcus hemolyticus*, are especially virulent, whereas others are not ordinarily dangerous, as for instance, *B. coli*. This latter is a normal inhabitant of the alimentary canal, and is not a serious pathogenic agent unless it gets out of its proper habitat.

Nature's defensive activities are inevitably hampered, and possibly defeated, by the chemical aberration brought about by an infection, for I regard it as axiomatic that the absence of any chemical deficiency spells absolute immunity to infection.

Resistance to bacteria is brought about in several ways, three of which are fairly well understood. The first of these is phagocytosis, or the devouring of the invading organisms by scavenger white blood-cells, the polymorphonuclear leukocytes. The number and phagocytic powers of these cells are enormously enhanced in certain circumstances.

The second of these antibacterial agents is a series of subtle and intangible substances

known as antibodies, which are produced in the widely scattered collection of cells known as the reticulo-endothelial system, and which assist in the destruction of the invading organisms. This destruction may take the form of complete dissolution—socalled lysis or bacteriolysis—and the antibodies bringing it about are called bacteriolysins. An infection causes a very marked increase in lysinogenesis, or the production of bacteriolysins, just as it may cause leukocytosis.

Still another form of antibacterial activity depends upon the clasmatocytes, or histiocytes, which are mononuclear cells said to be produced in certain reticulo-endothelial tissues. Unlike the polymorphonuclear leukocytes, they are not found in the blood, but may occur in various body fluids—the peritoneal fluid, the pleural fluid, etc.

There are other kindred substances that aid the body in its defense against infection, such as the opsonins, agglutinins, and precipitins, all of which are essentially sensitizers that prepare various organisms for destruction in one of the ways mentioned above.

In response to an invasion of bacteria, Nature marshals its fighting forces with amazing rapidity. It has been calculated that, in certain conditions, such as acute appendicitis, the body will throw into the fight as many as one hundred billion polymorphonuclear cells. This tremendous augmentation of the leukocytic defense forces may occur within a few hours and can be estimated from the white blood-cell count.

Reverting for a moment to the Hippocratic axiom, if Nature is responsible for overcoming bacterial invasions, the most rational antibacterial effort will be to supplement Nature. This undoubtedly was what Sir Almroth Wright had in his mind when he suggested the opsonic method of treatment. His idea was to introduce into the body fairly innocuous material that would accentuate its natural antibacterial responses. As such therapeutic agents, he chose the bodies of dead germs which he presumed, and rightly so, would contain within themselves the same kind of antibacterial stimuli as the live bodies of the corresponding invading bacteria.

As the subject of immunology has developed, a number of artificial immunity stimulants have been introduced. First among these are certain nonspecific proteins, the parenteral introduction of which causes responses similar in nature, though different in degree. Just as the normal antibacterial reaction is characterized by phagocytosis, fever, and certain cellular phenomena, so a nonspecific protein may cause all three of these responses; and sometimes the patient suffers acutely because of the severity of the reaction.

While there is no denying the advantage of vaccine therapy, nor the attainments of nonspecific protein therapy, many discomforts have resulted from variable responses on the part of patients. Because of this, many efforts have been made to deproteinize these products and to mitigate the unpleasant and unpredictable reactions, as well as to sensitize or modify the bacterial suspensions, in order to lessen the discomforts of such treatment, while increasing its therapeutic value.

One of the most acceptable developments in this field is the denatured blood-serum product known as Edwenil, which is given as a stimulus to the defense responses enumerated above. This antigen was based on some work done in the treatment of acute rheumatic conditions in England, and was first imported from that country. Following a series of laboratory and clinical trials, this product is now being made here in America, and I have found it a potent and widely applicable antibacterial remedy.

Edwenil is a denatured nonspecific protein, made by combining certain protein elements in normal blood serum and beef extract, and fixing these beneficial agents so that the detrimental reaction-causing proteins can be discarded. As a result, it gives a more marked and favorable therapeutic response with less detrimental reaction. In fact, I have used it in many cases without any reaction whatever, although I confess that under certain circumstances there may be some discomfort.

Some of the responses to this treatment differ very materially from those to which we have been accustomed following the use of bacterial vaccines and nonspecific proteins. For example, instead of raising the temperature, as so often occurs following the injection of a milk protein or peptone or typhoid vaccine, the use of this product may reduce the temperature as much as five degrees in twenty-four hours. I have observed this in pneumonia too often to ascribe it to mere coincidence. Also, instead of the alarming negative phase seen following the use of bacterial vaccines, whether stock or autogenous, I have not infrequently noted just the opposite response. The patient feels as if some stimulating tonic agent had been given.

Therapeutic Applications

In my work as an industrial surgeon, I encounter numerous infections and infectious diseases, of which the respiratory infections comprise a large group. In many of these, the response to this new antigenic treatment is much more rapid than that to which I have been accustomed following the use of previous measures. In other words, the antibacterial process is hastened—the

toxemia is lessened, the temperature is reduced, a focus of an acute infection may be localized, and the duration of the invalidism is definitely reduced.

Since there are no directly active therapeutic agents (antibodies) in Edwenil, as there are for example in an antitoxic serum, it is evident that this agent provides a means of stimulating Nature's defensive resources. Some of the more recent laboratory investigations offer extraordinary confirmation of this.

It is not difficult to study the effect of an agent like this on the white blood-cell count, and this has been done[1]. More recently, studies have been published regarding the influence of Edwenil upon the clasmatocyte count, and from this report[2] it is apparent that these cells are greatly increased following the use of this agent in certain infections.

In this experimental work, Coddington artificially introduced live streptococcic cultures into the pleural cavities of rabbits. If nothing else is done to these rabbits, a purulent pleuritis develops that eventually becomes an empyema, and the animal usually dies within five or six days. During the earlier stages, if the cellular content of the pleural fluid is studied under the microscope, one detects a considerable increase in the number of non-humoral phagocytes or clasmatocytes. If Edwenil is given to these rabbits, not only is death averted and purulent developments frequently prevented, but studies of the clasmatocyte count in the pleural fluid disclose extraordinary increases in the number of these cells, amounting to 400 or 500 percent in two or three hours. This provides a method for measuring objectively one of the mechanisms stimulated by Edwenil to bring about control of the infection, for the treated animals do not develop streptococcic abscesses and do not die, as do the controls. It also demonstrates how the invading bacteria (introduced artificially in these experiments) are disposed of—they are phagocytized by the enormously increased numbers of reticulo-endothelial cells.

I have been especially interested in these researches because they explain some of the results that I have obtained in my clinical work. In order to illustrate this, I have selected half a dozen case histories that typify the many gratifying experiences that I have had with this attainment in immunotherapy.

I record these experiences exactly as they occurred, in the hope that they may constitute a practical contribution to medical therapeutics, having in mind the words of a great European clinician, who said: "Theoretical considerations of pathological problems are without doubt of value but, without the support of clinical experiences, they are worthless to any patient."

Illustrative Case Reports

Case 1:—P. R. G., white male, age 24. The history described a series of slight rigors during the previous twenty-four hours, with headache, general myalgia, and constipation. On *examination*, the throat was found congested; there was mild laryngitis and bronchial breathing, but no râles or dullness over the pulmonary area. Cough and sneezing were present, and expectoration was difficult. The pulse was 120; temperature, 102.6° F. *Urinalysis*: Color, deep-yellow; strongly acid; no casts, blood, cells or pus; albumin and sugar absent. *Diagnosis*: postinfluenzal respiratory infection.

An injection of 4 cc. of Edwenil was given, and also a brisk purge. Liberal water intake was advised, with liquid diet and complete rest in bed. Twenty-four hours later the temperature was 99.8° F.; pulse, 100; myalgia gone; general condition satisfactory. Two (2) cc. of Edwenil were given and the patient kept in bed. At the end of the third day he was convalescent, and in one week was back at work.

Case 2:—Mrs. G. S., age 38. First seen at 10 P.M., three hours after she had had a severe chill, followed by rising temperature, severe headache, and non-productive cough. There had been pain in the throat, moderate dyspnea, slight nausea, and general myasthenia for the previous three days. She was hospitalized at once. *Examination* showed a temperature of 103.4° F.; pulse, 136; respiration, 32; crepitant râles over the upper pulmonary zones; expectoration very slight but tinged with blood; red blood cells, 4,280,000; leukocytes, 11,400; hemoglobin 76 percent; the urine showed chloride deficiency. *Diagnosis*: lobar pneumonia.

Four (4) cc. of Edwenil were given immediately. Restricted diet, a saline laxative, and a liberal water intake were prescribed. For the next three days, Edwenil was given in 2-cc. doses every twelve hours. All symptoms improved rapidly, and patient was taken home in an ambulance at end of five days. One week later she resumed her work (telephone operator), but in opposition to my advice.

Case 3:—H. J. R., white male, age 64; industrial worker. The history described "rheumatism," located in the lumbar region and along the distribution of the left sciatic nerve. X-Rays disclosed osteo-arthritic changes in the lumbar spine. The patient was given sodium salicylate and potassium iodide, with physical therapy, including infra-red, diathermy, and massage, and a suitable dietary régime, and was urged to increase his water intake. No real improvement followed three months of this treatment.

On the theory that there was some undiscovered focus of infection, it was decided to try Edwenil. He was given an injection of

1.—Coddington, H. W.: Observations on the White Blood-Count, Phagocytosis, and Other Bactericidal Powers of Whole Blood, "The Oakmont Papers on Immunology," 1935, p. 29.

2.—Coddington, H. W.: A Study of Clasmatocytes and Polymorphonuclear Response in Streptococcic Infections, *Am. Med.*, April, 1936, 42, p. 233.

4 cc., and the diathermy was continued. After the third injection of Edwenil, the patient reported slight improvement, but said that the pain and discomfort had been noticeably increased after the first two doses. He was urged to continue the injections. During the second week of treatment, he reported a series of profuse sweats, increased urination, and profuse nasal discharge; but the pain in the back was much better. He is still receiving Edwenil once a week, and remains comparatively free from his former lumbar and sciatic pains.

Case 4:—W. F. G., white male, 41 years of age; a chronic sufferer from bronchial asthma, sinus infection, and a series of nasal polyps, which have been surgically removed a number of times. He has frequent asthmatic attacks, for which adrenalin (epinephrin), atropine, and morphine have been been the routine treatment.

Following a sinus-drainage operation, he was given Edwenil on alternate days for two weeks. There has been relief from his former symptoms most of the time since then. He still has an occasional injection, usually about 3 cc., and is in better general health than for several years previously.

Case 5:—F. H., an unmarried colored female, age 32, well-nourished, whose only complaint was pelvic distress, which is emphasized at her menstrual period. Both fallopian tubes were easily palpable, indurated, and tender; no vaginal discharge; smears negative for diplococci; cryptic tonsils, evidently infected. Urinalysis, negative; temperature, normal; no cardiac lesions; lungs negative; bowels reported regular.

As it was evident that there was a concealed focal infection, this patient afforded an opportunity to test the diagnostic as well as the therapeutic value of Edwenil. Two 4-cc. doses and one 2-cc. dose were given the first week; thereafter, 2 cc. twice weekly for four weeks. There was no unfavorable reaction, and the patient continued her work (general housework). After a little over a month, examination showed that neither fallopian tube could be palpated easily, the induration had disappeared, and no discomfort had been experienced during the latter part of the treatment. The tonsils were inactive but still hypertrophied. (They will be removed later.)

It is beyond my ability to prove, or even allege, that Edwenil was responsible for the change in this patient's condition; but the fact remains that since this treatment she has had no pain or discomfort, and she looks and feels better. She eats well and sleeps restfully, which she did not do before. I believe that Edwenil reinforced her natural defenses, which enabled her own physiologic activities to rout the attacking bacteria.

Case 6:—L. M. T., a white male, age 58, presented himself with an angry-looking and very tender early carbuncle on his right forearm, into which an impetuous young physician had prematurely plunged a sharp scalpel. The arm was swollen and tender even above the elbow. The patient had fever and, as he described it, "was sick all over." I gave him 4 cc. of Edwenil and placed the arm in a hot, wet dressing, which I told him to change every hour. Twenty-four hours later a copious discharge of pus was oozing from the premature incision, the whole tumor was softening, and much of the tenderness was gone. Another 4-cc. injection was given, and after the next twenty-four hours the trouble was practically over.

For some undiscovered reason, there are many carbuncles in my territory. Heretofore I have excised them with success, but that means hospital expense and the loss of from ten days' to two weeks' work. This patient, a locomotive engineer, lost only two days from duty. Hereafter I shall treat all my carbuncle cases with Edwenil.

Note: These reports were selected from a great many, to represent widely different conditions in which I have used Edwenil. All were cases of infections or syndromes due to infectious invasion.

Last winter the Middle West had an epidemic of respiratory conditions, some of which were called influenza, some la grippe, and others acute coryza. All, however, prepared the victims for a pneumonia, of which there were many cases. I treated all these cases with Edwenil whenever I could get the remedy, and did not lose one. I am using Edwenil to abort all respiratory, nasopharyngeal, and bronchial conditions, when seen early; when seen later, they are overcome in from two to four days.

613 First National Bldg.

HIDDEN TAXES

If ever education were necessary, it is to sell the man-on-the-street-taxpayer two ideas: (1) that it is the consumer of all classes and kinds of goods who is now paying 75 percent of all taxes collected; and (2) that everybody should work tooth-and-nail to have our system of taxation changed so that all taxes shall be direct taxes, which cannot be concealed or pyramided.

When we pay an income tax, we become tax-conscious. If we think we pay too much, we grumble and use pressure on the politicians to have the taxes reduced. But when we actually pay a much greater tax rate on a loaf of bread, on our shoes or clothing, or on a package of cigarettes, we are not tax-conscious, because the tax, after having been pyramided, is included in the price we pay.—Clover Business Service.

The Treatment of Vegetative Excitation*

By Drs. A. Jores and Cl. Goyert, Rostock, Germany

ROTHLIN first drew clear-cut conclusions from the newly recognized fact that disturbances in the vegetative nervous system almost invariably involve parasympathetic, as well as sympathetic, overstimulation. By means of animal experiments, he established the fact that the simultaneous administration of the vagus inhibitor Bellafoline (levo-rotatory alkaloids of belladonna leaves) and the sympathetic inhibitor Gynergen (ergotamine tartrate) does not diminish the specific effects of these two substances. Furthermore, he confirmed the pharmacologic findings of Friedberg and Gordonoff, that the combination of the brainstem sedative phenobarbital with the two aforementioned drugs produces a preparation with distinctly enhanced central and peripheral effects.

This interesting combination of three active neurotropic drugs has been introduced into therapeutics under the trade name Bellergal and has already proved quite useful. Wichmann, Kumbruch and Leu have reported good results with it in vegetative neuroses and allied conditions; Buch in cases of severe migraine; Grundner, Heesen and Smilovits in vegetative disturbances of tuberculous patients, especially night sweats; and DiBenedetto in dysmenorrhea. All these papers are based on purely clinical observations, but their value should not be minimized. The fact must not be overlooked, however, that, particularly in conditions with vegetative instability, results due to mere suggestion are always posible and that there is hardly another group of patients in which it is more difficult to judge therapeutic effects objectively. In view of this consideration it seemed to us advisable to test the effects of Bellergal in man by means of purely objective experimental observations.

Objective Tests

The literature contains numerous experimental methods for testing the irritability of the vegetative nervous system. But here again it must be emphasized that a good deal of caution is advisable in connection with the use of these tests, and above all with the interpretation of the results, because there are numerous other factors that influence vegetative functions which it will probably never be possible to eliminate or keep constant. For this reason we found it necessary to employ many different test methods in order to be able to support our conclusions, not merely on one particular set of results, but upon the total results of the entire series of different tests.

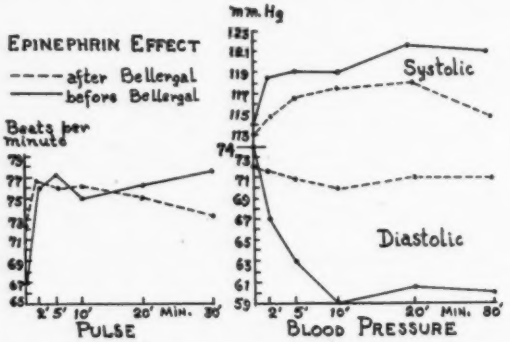


Fig 1.—Mean behavior of pulse and blood pressure in 20 patients under the action of epinephrin.

We first tested the reaction of our patients to epinephrin and pilocarpine. Following injections of each of these products the systolic and diastolic blood pressure, as well as the temperaure, was noted. From among the reflex tests recommended in the literature to measure the irritability of the vegetative nervous system, we used the ocular pressure test of Aschner. Finally, we registered the respiratory arrhythmia and the dermographism.

The detailed procedure was as follows: The reactions of 20 patients were measured before and after administration of Bellergal (1 tablet=0.1 mg. of Bellafoline; 0.3 mg. of ergotamine tartrate; and 20 mg. of phenobarbital). One hour preceding the experiments the patients were put to bed and asked to relax completely. All experiments were made between 11 A.M. and noon. On the first day blood pressure, pulse and temperature were noted, and the tests for the ocular pressure reflex of Aschner, the dermographism and the respiratory arrhythmia were likewise performed. Then followed the subcutaneous injection of 0.5 mg. of epinephrin. Pulse and blood pressure were then noted after 2, 5, 10, 20 and 30 minutes. The temperature was taken after 15 and 30 minutes, and the Aschner reflex, dermographism and respiratory arrhythmia were again registered. The following day the reaction after 0.05 mg. of pilocarpine was studied. Thereupon followed

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the Bellergal treatment, the dosage and duration of which varied in individual cases and will be described in more detail in the clinical part of this paper. At the termination of the Bellergal treatment, all the above-mentioned tests were repeated under identical conditions.

It is impracticable to include in this paper the individual figures illustrating our findings, but we wish to emphasize that they all pointed to the same conclusion. The following tables and curves therefore represent the averages of our figures for the 20 patients tested by us.

Table I illustrates the mean reactions of our patients to Aschner's reflex test, dermographism, and respiratory arrhythmia.

TABLE I

Before Treatment with Bellergal			After Treatment with Bellergal		
Aschner Test	Dermographism	Respiratory Arrhythmia	Aschner Test	Dermographism	Respiratory Arrhythmia
— 6	r 15	— 2	—17	r 19	—19
+13	w 4	+17	+ 3	w 1	+ 1
++ 1	r+w 1	++ 1	++ 0	r+w 0	++ 0

++ for Aschner's reflex indicates not only slowing, but softening of pulse.

In the column "Dermographism", r indicates red, w indicates white, and r+w stands for white dermographism with a red border.

As will be seen from this table, Aschner's reflex, before Bellergal medication, was negative in only 6 cases, but after Bellergal, in 17 cases; white dermographism was present in 4 cases before Bellergal, but after Bellergal, in only 1 case; respiratory arrhythmia was present in 18 cases before Bellergal, but after Bellergal, in only 1 case.

Tables II and III show the results with the same tests after epinephrin and pilocarpine injections.

TABLE II. PATIENTS AFTER EPINEPHRIN

Before Bellergal Treatment			After Bellergal Treatment		
Aschner Test	Dermographism	Respiratory Arrhythmia	Aschner Test	Dermographism	Respiratory Arrhythmia
— 0	r 14	— 0	—14	r 19	—18
+11	w 4	+ 5	+ 6	w 1	+ 2
++ 9	r+w 2	++15	++ 0	r+w 0	++ 0

TABLE III. PATIENTS AFTER PILOCARPINE

Before Bellergal Treatment			After Bellergal Treatment		
Aschner Test	Dermographism	Respiratory Arrhythmia	Aschner Test	Dermographism	Respiratory Arrhythmia
— 2	r 14	— 0	—17	r 19	—17
+13	w 4	+ 8	+ 3	w 1	+ 3
++ 5	r+w 2	++12	++ 0	r+w 0	++ 0

As will be seen from Tables II and III, similar results were again noted. In all three tests there was a distinct reduction of vegetative excitability after treatment with Bellergal.

The pulse frequency 5 minutes after the epinephrin injection had increased from 67 to 77; i.e., 10 beats per minute. When the injection was made following Bellergal medication, however, the increase in pulse frequency was only 5 beats per minute (from 72 to 77). The low average pulse at rest of 67 is due to the fact that the majority of our patients before treatment showed a vagotonic tendency (ulcer symptoms, spastic constipation, etc.). This explains why the mean pulse rate of 72 at rest during the Bellergal treatment was reached. Whereas, before treatment there was noted a marked reduction of the diastolic pressure, accompanied by a marked increase of the blood pressure amplitude, the reduction of the diastolic pressure following treatment was found to be extremely small.

Under the influence of pilocarpine which, acting similarly to nicotine through paralysis of the synaptic vagal ganglia, increases the heart rate, fundamentally similar results were obtained (see Fig. 2). Here again the increase in the pulse frequency after Bellergal treatment is less pronounced and, as before, the much less pronounced decrease of the diastolic blood pressure is particularly striking.

The behavior of the temperature after epinephrin and pilocarpine is shown in Fig. 3. Again, the temperature fluctuation in patients treated with Bellergal is much less pronounced.

The findings with all of the test methods show that there is a pronounced diminution of vegetative excitability following treatment with Bellergal. Since this conclusion is based, not only on the averages for all tests, but on the figures obtained in each individual test as well, we believe that we are conservative in claiming that we were able to prove experimentally, in the clearest possible way, that Bellergal reduces vegetative irritability.

Clinical Tests

We have treated with Bellergal a total of 40 patients, who can be grouped roughly as follows:

1.—Gastric disturbances of the ulcer type, without demonstrable ulcer lesions.
2.—Gastric and duodenal ulcer.
3.—Spastic constipation.
4.—Nervous heart conditions without any organic findings.
5.—Neuropathies of diverse types.
6.—Graves' disease.
7.—Disturbances linked with hypertonia.

Group 1 includes 7 patients with gastric disturbances of the ulcer type but without demonstrable organic lesion. After treatment with Bellergal all patients were completely freed from symptoms by the fourth or fifth day. During the first three days of treatment, the dose was 2 tablets 3 times daily; beginning with the fourth or fifth day, 1 tablet 3 times daily; from the eighth to the tenth day onward, 1 tablet twice daily.

Case history: A laborer, 42 years of age, had suffered from stomach disturbances for about 8 years—acid eructation and hunger pains, chiefly during the spring and fall seasons. He was operated upon twice, on suspicion of ulcer, but each time without pathologic findings. Our x-ray diagnosis shows that the operations were merely exploratory in nature, since both stomach and duodenum were roentgenologically found intact. The operations had no effect on the disturbances. Furthermore, the patient complained of constipation and sleeplessness. Bellergal medication was ordered, 2 tablets 3 times daily for 3 days. On the second day peaceful sleep was induced without any additional hypnotics. After three or four days there was marked abatement of the stomach symptoms. The dose was then reduced to 1 tablet 3 times daily. After 2 weeks the patient was dismissed from the hospital free from symptoms.

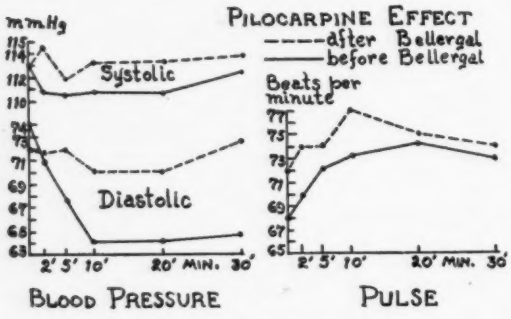

Fig. 2.

Group 2 comprises 7 cases of peptic ulcer. The usual ulcer treatment was used, in part dietary, in part by feeding through a stomach tube. Five (5) of the patients suffered from chronic constipation. Medication with 1 tablet Bellergal three times daily for 3 weeks brought prompt abatement of pain and favorably influenced the constipation.

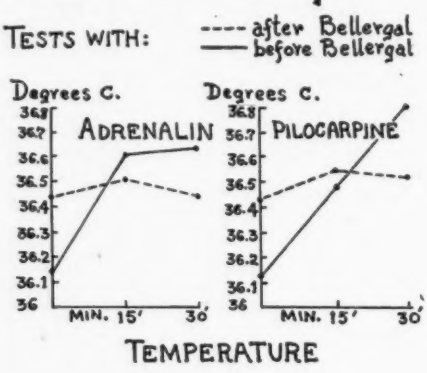

Fig. 3.

Group 3 comprises 7 cases of chronic constipation, partly among youthful patients, mostly of such long duration that the patients had become used to the most diverse laxatives. Bellergal was ordered, 2 tablets 3 times daily for three days, then 1 tablet 3 times daily. In most instances the stools became normal after three days. In 3 cases it was necessary to reduce the dosage because diarrhea occurred.

Case report: A male patient, 41 years of age, had used various laxatives for years, due to chronic constipation. After 2 tablets 3 times daily for three days, the stools became regular, followed by diarrhea on the fourth day. Treatment was interrupted for two days, then 1 tablet 3 times daily was ordered. Normal stools resulted, but later there was diarrhea. Adjustment of the dose to one tablet daily gave normal stools.

Group 4 comprises 4 cases of purely nervous heart disturbances without any recognizable finding, either roentgenologically or electrocardiographically. Symptoms consisted of palpitation and easily induced nervous irritability, with anxiety and a sense of oppression. Therapy: 1 tablet of Bellergal 3 times daily. Three cases were markedly improved after a week, while the fourth case was benefited only after two weeks of treatment.

Group 5 comprises 10 neuropathic cases. They were mostly youthful, vegetatively quite unstable patients, with manifestations of the most diverse nature. Symptoms consisted of localization of pain in the various organs, general exhaustion, inability to work, and on examination no organic disorder was found. Treatment was started with Bellergal, 2 tablets 3 times daily, followed by gradual reduction of the dose. In some cases we noted that, after three weeks, treatment could be stopped and a period of observation of two months showed no recurrences of the disturbance.

Case report: A carpenter, 21 years of age, had been nervous since his fifteenth year, with outbreaks of sweating, a sense of oppression in the heart and stomach region, and a tendency to palpitation. He had been treated previously with digitalis. Pains in the liver region had also been treated, without results. After only two days of Bellergal therapy there was distinct improvement; outbreaks of sweating disappeared, and sleep became more restful. On the third day, treatment was reduced to 1 tablet twice daily, and this dose was maintained for 14 days. After five days he felt completely relieved and in good health. No further disturbances occurred and at the end of 14 days the patient was released, free of symptoms.

Group 6 comprises 3 cases of Graves' disease, 2 severe and 1 slight. The most severe case was complicated by cardiac insufficiency. All 3 cases were treated by means of roentgen rays and with Graves'-disease diet. At first the patients received 2 Bellergal tablets 3 times daily; later 1 tablet 3 times daily. Improvement came rapidly. In all 3 cases there was a distinct sedation of the general irritability and the preparation was well tolerated without causing any by-effects.

Group 7 comprises 2 cases with hypertonia, accompanied by various disturbances, such as headaches, fainting fits, attacks of dizziness of short duration, and general irritability. The blood pressure was not reduced by the medication. We administered 1 tablet of Bellergal 3 times daily, and later 1 tablet twice daily, apparently with beneficial symptomatic results.

In going over our entire case material, it is striking to note that not one out of the 40 patients failed to be benefited by Bellergal. In the majority they were completely relieved of their symptoms. Only after the conclusion of this entire series of 40 cases did we find 2 additional cases in which Bellergal produced no results. In both cases it could be shown subsequently that the disturbances were due to organic lesions, which at first were believed to be merely functional vegetative disorders. Based on these observations, we are inclined to believe that whenever the symptoms do not respond to Bellergal, one is justified in assuming that they are not due to functional disturbances, but to an organic lesion.

We have never observed any by-effects due to belladonna intoxication, such as dryness in the mouth or disturbances of accommodation; neither have we noticed any particular drowsiness during waking hours, due to the barbiturate component of Bellergal. The results of this medication, in the majority of cases, appeared relatively quickly, and after only two days, or at the most 3 days, patients almost invariably reported that they felt better. The improvement was due, not only to the disappearance of the symptoms, but the patients claimed that they felt generally better and stronger. Almost invariably this resulted in more restful and deeper sleep.

In general, we have started treatment, for the first three or four days, with the comparatively high dose of 2 tablets 3 times daily, but this dose was never exceeded. It is, of course, always advisable to reduce the dose as soon as possible. In some cases which we were able to observe and re-examine over a prolonged period, one is justified in claiming permanent results after treatment lasting for four to six weeks, so that further treatments became unnecessary.

Conclusions

1.—The effect of the simultaneous use of Bellafoline, ergotamine tartrate and phenobarbital, in the form of Bellergal, upon the vegetative nervous system was studied experimentally in 20 patients. For this purpose, the reactions of these patients were observed before and after Bellergal treatment by means of the following tests: Aschner's ocular pressure test; the dermographism test; the respiratory arrhythmia test; as well as the reactions of the pulse, blood pressure and temperature, following epinephrin and pilocarpine. With all these tests, Bellergal was shown to produce clear-cut reduction of vegetative irritability.

2.—Forty (40) cases, with vegetative irritability as an outstanding symptom, were treated with Bellergal. Among these cases were neuropathies of various types, nervous heart disturbances without organic lesions, pseudo-ulcer cases, peptic ulcer, and spastic constipation. With 2 tablets of Bellergal 3 times daily for the first few days, followed by a gradual reduction of the dose, we obtained, in all cases, marked improvement and, in the majority, even complete relief of symptoms. By-effects were never observed.

We therefore feel justified in recommending this preparation for the successful treatment of the numerous conditions due to neuro-vegetative irritability.

PHYSICAL AND OFFICE THERAPY AND RADIOLOGY

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FOR OFFICE THERAPY

RUSSELL A. WINTERS, M.D.

"Simple" Physical Therapy Measures

IN the annual report of the Council on Physical Therapy, published in the *J. A. M. A.*, April 6, 1936, we are informed: "In the opinion of the Council, at least 90 percent of physical therapy treatments can be given by simple measures, such as heat, massage and exercise."

Some years ago an internationally-recognized surgeon claimed that he could successfully perform almost any abdominal operation with simply a pair of scissors, a couple of hemostats, and a needle. The practical physical therapist, while believing that "the greatest truths are the simplest," also recognizes that the simplicity of the "good old days," prior to the twentieth century, has disappeared in the complexity of modern life, with its various deteriorations and disabilities.

The ancients originally believed that heat was one of the four cardinal necessities in the composition of all things, animate and inanimate; earth, air, and water constituted the other complemental, *simple* essentials. If, as has been asserted, 50 percent of the medical malpractice suits in a certain large state arise from alleged diathermy burns, there is something radically wrong with either the concept of heat as a simple, innocuous remedy, or else with the presumed simplicity of its applicability—in this scientifically advanced day and age.

The French chemist, Lavoisier, in the concluding quarter of the eighteenth century, established the then-revolutionary and brilliant hypothesis that the heat of the body is due to combustion or oxidation within the tissues. According to van't Hoff's law, chemical reactions are essentially doubled, or even trebled, in activity by a rise in temperature of 10° C. Consequently, an increase of even a few degrees F. will markedly accelerate the vital processes—an acceleration which, even when expertly supervised, may occasionally be more easily initiated than subsequently controlled.

Walking, swimming, an occasional and strenuous game of golf, calisthenics, massage, are all fundamentally to be classed as exercise, yet, qualitatively, they differ considerably as to their precise therapeutic applicability. Passive vascular exercise, as now available by means of various more or less complicated devices, is something vastly different in its scientific and therapeutic implications from any other form of passive exercise.

We will all unreservedly agree that heat and exercise, so mutable in their manifestation, are universally essential to health; pre-

sumably, static electricity, sinusoidal and faradic currents, and vibration are to be included, therapeutically, within this elastic term, "exercise." Excluding radium and x-rays, as possibly extra-physical-therapy measures, there still remain hydrotherapy, aerotherapy, galvanism, ultraviolet radiation, and a few other definite or indefinite natural agencies, to be more or less reluctantly restricted to a 10 percent margin of physical therapy usefulness.

Our editorial thought, however, is not an attempt to differentiate invidiously, in percentages, between the multiform expressions of physical therapy, but to caution against a too-literal interpretation of the term "simple measure." If heat and exercise be indeed simple measures, it is imperative for professional reputation and concomitant usefulness to understand that simplicity of thought is not inevitably equivalent to simplicity of practical expression.

Alexis Carrel, referring to the apparent simplicity of the water of the ocean—until it is examined through a powerful microscope—pertinently concludes: "Thus, the things of our world are simple or complex, according to the technics that we select for studying them. In fact, functional simplicity always corresponds to a complex substratum."

J. E. G. W.

The Ambulant Treatment of Hernia*

By C. E. Ward, M.D., Cleveland, O.

THE incidence of hernia is so common (one person in fifteen) that it compels our immediate attention. At the present time we have two methods of treatment: one operative; the other by injection. The operative method undoubtedly has its place in surgery and will always retain it.

In discussing the merits of the two methods, the question of recurrence is foremost. Recurrence following a surgical operation is much more frequent than is generally supposed by physicians, and certainly more than the general public is led to believe. Most authorities agree that 18 percent of primary herniorrhaphies are a failure, while they estimate that, in secondary operations, it may run much higher.

A surgical operation for hernia is not free from complications, and it necessitates hospitalization, with the added cost of eight to ten weeks' loss of employment and income, to say nothing of the possibility of postoperative pneumonia, bronchitis and other pulmonary diseases, or retention of urine requiring catheterization, with the possibility of cystitis and pyelitis.

The injection treatment is an ambulatory service; the patient is not compelled to give up his employment or his social activities; there is no danger of infection; and with reasonable skill and care, complications never occur. Comparing the surgical operation with the injection method, the choice, as I see it, is entirely in favor of the latter. The number of recurrences following the injection treatment of hernia is generally considered to be as low as 2 percent.

Most of the unfavorable criticism of the injection method comes from men who have never seen this treatment given nor watched its results in trained hands. The same men argue that we may inject the fluid into the peritoneal cavity, the iliac vessels or bladder, and in so doing, cause epididymitis, hydrocele, sterility, etc. Were they familiar with the procedures of the injection method, they would realize how erroneous are their ideas. The only real danger in the treatment of hernia by the injection method is not in the method itself but in the incompetency of the operator. The fluid is not injected into the places above mentioned, but into the inguinal canal. The solution used is a sterile one and, therefore, could not cause infection.

A recent article by Bissell and Andrews, quoted by Dr. Bratrud, of the University of Minnesota Medical School, in one of his articles, states: "The results of operation on direct hernias are so bad as to constitute a major surgical scandal; when one considers that the recurrences are far more dangerous than the original hernias, it seems high time that the subject was thoroughly reconsidered." This same statement was made many years ago by Dr. Deaver. The same criticism might, with equal propriety, be applied to the operative cure of femoral hernias. Dr. Fitch states: "The failure to accomplish a cure in the treatment of hernia by operation can well be classed among the tragedies of surgery."

In the injection treatment of hernia most of our difficulties occur in children, particularly in infants. In cases of young children I have found it advisable, in fact almost necessary, to give a few whiffs of ether and use considerable restraint while giving the treatment.

*Read before the Lakewood Clinical Club, Oct., 1935, and, by invitation, before the Cleveland Clinical Club, Dec. 14, 1935.

The Truss

Among the various adjuncts in the injection treatment of hernia, the truss is unquestionably the most important. A man attempting to do this work must be thoroughly competent to fit a truss, or at least to know when a truss is properly fitted. A case of hernia cannot be cured by ambulatory methods unless the truss holds the hernial content in the abdominal cavity. It is necessary during the treatment that the patient wear the truss night and day throughout the treatment, and for thirty days thereafter. At the end of the sixty-day period the patient is permitted to remove the truss in bed, but it must be applied in the morning before he arises. The exact length of time that the patient is compelled to wear the truss is more or less dependent upon the type of employment. A day laborer should wear his truss for at least six months during his heavy working hours, removing it when he returns home. With equal propriety, a patient who is employed in lighter or clerical work would not have to wear his truss for that length of time.

In the selection of a truss, it is my belief that a spring truss is the best. There are, however, certain feminine types of adult males who, in all probability, would be better fitted with an elastic truss. A point that must be made clear to the patient is that, from the day he applies his truss, it no longer is his property but that of the surgeon attending him and must be removed only by him. If one does not make this point clear, the patient will, in all probability, have the truss off about one-third of the time, and unquestionably the hernia could slip during this interval.

In many hernias it is impossible to fit a patient with a truss of any type that will hold it. In this event it is necessary to place the patient in bed in the Trendelenburg position and give several injections. The resulting edema and infiltration, which occurs from the injections, will help the truss to hold the hernia in position. As soon as this is accomplished the patient may be continued as an ambulatory case. It is well, before giving a patient the first injection, to have him wear his truss for several days and nights, to become accustomed to the rather unusual pressure.

Reduction of the Hernia

If a hernia is irreducible it is not a case for the injection treatment; and this brings up the question of reduction of a hernia. Many hernias are reduced with considerable ease, and others tax one's entire ingenuity. In the event of difficulty, it is well to place the patient in the Trendelenburg position, raise the shoulders with a pillow, flex the thighs and rotate them inward. All of these maneuvers tend to assist in relaxing the rings, but if they are not sufficient it is often helpful to draw more of the hernia through the ring as it relaxes, thus frequently maknig a difficult reduction simple.

In the question of diagnosis, Dr. Helmuth years ago defined the terms "incarcerated" and "strangulated" hernia in language that leaves no question in our minds as to what he means. At the present time, any kind of a hernia may carelessly be called an incarcerated or a strangulated hernia, simply because it has resisted the first attempt at reduction. An incarcerated hernia is one in which the protruded portion of the abdominal contents is retained in its abnormal position without being strangulated or giving rise to an inflammatory process. A strangulated hernia is one in which the contents of the intestine are prevented from passing through the lumen of the herniated portion of the gut and the circulation is impeded.

Important Factors

Many physicians are of the opinion that the injection treatment of hernia is a simple procedure; this is true, in a strictly technical sense, but it is also essential to know the anatomy of hernia minutely and be able to differentiate the various types of hernia—direct, indirect, or femoral. Without a working knowledge of these diagnostic points, the injection method would not meet with success.

A hernia must not be injected until one is positive that the entire hernial mass has been reduced. A point well worth remembering is that a careful examination should be made of both testicles, as to their size and consistency, and whether or not a varicocele, a hydrocele, or epididymitis is then present. This record is a proof to the patient and, if necessary, before a court, of his condition before starting treatment. I have made no selection in the cases that I have treated; in fact, many of my patients are people who have already been refused surgical relief. I, personally, would not have attempted to operate upon most of them.

Dr. Masson, of the Mayo Clinic, in discussing a paper on hernia by Dr. Bratrud, stated: "We must not be too critical of the method, because we should remember that, until a few years ago, hemorrhoids and varicose veins were looked upon as surgical conditions, and their treatment by the injection method was considered a treatment to be used by quacks; yet, at the present time, its value in this field is recognized by the medical profession, and the procedure is being used extensively." He also states: "This method of injection is going to be tried out extensively in the future. There is no doubt that the percentage of recurrence following surgical operation is much higher than the med-

ical profession realizes, and the most important reason for this is probably that many operations for hernia are done by men with little surgical experience." He is of the opinion that the injection treatment should be in the hands of specialists. We all know of Dr. Masson's skill in operating and of his fascial transplantations. Very few of the younger operators will be in a position to follow his technic. Dr. F. L. Smith of the Mayo Clinic, has injected hernias and is enthusiastic over the method.

After all surgical operations for hernia, the incidence of recurrence would be greatly lessened if the patients were properly fitted with a truss before permitting them to leave their beds and instructed to wear it for a considerable period of time. If there is any evidence of recurrence, injection treatments should be given at once.

Dr. Bratrud has been carrying on extensive experimental work and has shown that, shortly after an injection, there is a definite reaction, manifested by edema of the tissues and the production of fibroblasts, which develop into mature fibrous tissue cells. Dr. Rice, of Minneapolis, confirms his findings. A great debt is owed to Dr. Bratrud for placing this method of treatment upon an understandable basis.

Technic

In the ambulant treatment of hernia a very important point is the preparation of the skin. In my earlier work the inguinal region was shaved and benzine was applied, followed by alcohol. We found that, in shaving the patient and applying a truss, we defeated the object for which we were striving—prevention of infection of the hair follicles. By experience it was noted that, after shaving and the application of a truss, irritation of the skin, with vesicle formation, was common. This necessitated postponement of treatment, in some cases. At the present time the technic consists in trimming the pubic hair in the region that is to be treated and cleansing the surface with liberal quantities of alcohol.

In order to make the operation as painless as possible, I have developed what I call "Triple A" anesthesia, owing to the fact that there are three distinct anesthetics used in this technic. First it consists of 10 percent of Benzocain dissolved in one dram (4 cc.) of alcohol, to which is added one dram (4 cc.) of a 5-percent carbolized oil and one dram (4 cc.) of castor oil. The reason for the use of castor oil is to hold the application in the spot where one intends to make the injection. This solution acts as a local anesthetic to the skin and distinctly lessens the pain when the needle is inserted. The second procedure is the injection of a combination of Novocain (procaine) and Diothane. All physicians know the action of Novocain, and the action of Diothane is similar but more prolonged, lasting, as a rule, for several days.

Instead of first using a 22-gage needle, as advised for use in this work, I prefer to use first a fine, ½-inch subcuticular needle to create a wheal under the skin, after which the subcutaneous tissue is infiltrated. This needle is then removed from the syringe and the 1½-inch, 22-gage needle is inserted through the subcutaneous tissue and the external oblique fascia, into the internal ring, and the balance of the 3 cc. of anesthetic is there deposited. The needle is allowed to remain in place, and after five minutes the proliferant solution is slowly injected. A large, hot, moist pack is then applied to the injected area and allowed to remain for a few minutes, after which the truss is applied; the patient is then permitted to leave. This technic has reduced the amount of postoperative discomfort to a minimum.

In direct hernia I prefer to use a spinal needle, which is placed between the fascia and rectus muscles and pointed toward the hernial opening. The left index finger, by invaginating the scrotum, seeks and feels the opening, after which the needle point is pushed downward until it is felt by the finger, and the ring is then circled and the fluid deposited where desired. This technic is also applicable to the indirect type, closing the internal ring first, after which the canal and external ring are closed.

In the treatment of a femoral hernia, it is important to palpate the femoral artery with the middle finger of the left hand, after which the left index finger presses and gently rolls the femoral vein outward. The needle is then started at about the lower border of the pectineus muscle and directed upward and slightly inward until one knows that it has reached the femoral canal. Unusual as it may seem, femoral hernias are cured with less difficulty and require fewer treatments than the inguinal type.

In the injection treatment of hernia I use two syringes—a white one, which contains the local anesthetic, and a blue one, which contains the proliferant fluid. The object of this is to prevent an error, which could easily occur if the syringes were alike.

In injecting an inguinal hernia, it is my opinion that, until one is familiar with the injection technic, it might be better to inject the internal ring first, then the canal, and finally the external ring. I usually start with 3 cc. of the fluid for the first treatment, 4 cc. for the second, and 5 cc. for the subsequent treatments until twelve treatments are given. These treatments are usually given two days apart. In the treatment of children,

from 1 to 2.5 cc. of the sclerosing fluid should, I believe, be sufficient.

The number of injections required in a given case is rather indefinite; some men states that a cure has been effected in eight treatments. I, personally, have cured an umbilical hernia in a child with two treatments, but my method of treatment procedure in adults is never less than twelve. Occasionally I have had patients who, after their twelve treatments, showed a slight impulse, and have found it necessary to give a few more injections.

Age is no barrier. In my series of cases I have treated patients from one to seventy-six years of age. Moreover, the size of the hernia has nothing to do with the cure. If it is reducible and can be held in position with a truss, I believe that the injection treatment should be used. Many of my cases would have been considered inoperable, and I am free to state that I would not have had the courage to operate on a number of them.

I should hesitate to accept asthmatics and alcoholics for this treatment, as they are very unsatisfactory patients to handle. It is more difficult to retain a hernia with a truss if there is constant coughing.

The question naturally arises as to which is the best solution for the cure of hernia by the injection method. I am frank to say that I cannot positively answer that question. I believe any solution that will cause proliferation and not necrosis will probably prove effective. I am, at the present time, using four different solutions, and am also carrying out a series of experiments on guinea pigs to determine, by microscopic study, which preparation is best. This work has not progressed far enough to warrant making a statement at this time.

Unfavorable criticism of this procedure is, I believe, not the result of inherent faults of the method, but of the careless technic of untrained and incompetent operators.

United Bank Bldg.

NOTES AND ABSTRACTS

Mecholyl by Iontophoresis in Arthritis*

MECHOLYL is acetyl beta methylcholine chloride. It produces effects similar to those produced by stimulation of the parasympathetic nerves. It slows the heart, lowers blood pressure, constricts the bronchioles, increases glandular activity and intestinal tone, stimulates peristalsis, and dilates the peripheral vascular system. The latter action makes it useful in arthritis, inasmuch as circulatory disturbances are believed to play an important rôle in chronic arthritis and frequently accompany and aggravate the condition. In order to avoid the general effects of the drug and to concentrate its action at a local site, I employed Mecholyl locally, by the method of iontophoresis.

The therapeutic effect of this form of treatment might be explained by the deposition of the drug in the superficial tissues and its slow absorption from there, giving a prolonged, slight general vasodilatation, combined with a pronounced and prolonged local effect.

The treatment produced increased skin temperature and sweating, which continued for from six to ten hours, and a slight, diffuse redness.

While increased salivation, sweating, and slight weakness are occasionally noted by the patient, they pass off quickly, and in no case were any unpleasant or alarming symptoms observed.

Kovacs reported a series of cases in which Mecholyl was used by the method of iontophoresis. He noted that the best results were obtained in rheumatoid arthritis, 95 percent of the cases showing improvement. Good results, however, were obtained in many cases of the osteo-arthritic type. In both types of arthritis he reports that, where the patient had definite swelling, there was a reduction of the swelling. Alleviation of pain was prompt and increased mobility of the joints was noted.

The method used is as follows: The affected joint is wrapped with a piece of sheet asbestos which has been saturated in a 1/5 of 1 percent solution of Mecholyl. This is covered tightly with a piece of block tin, which is kept in place with an elastic bandage.† The block tin is connected to the positive pole of the galvanic machine. The negative pole may be applied to the buttocks, thigh, or calf of the leg.

Several joints may be treated at one time simply by connecting the several joints treated to the positive pole. The current is turned on to between 25 and 30 milliamperes and kept on for between twenty-five and thirty minutes.

The number of treatments necessarily varies. In the beginning, treatments may be

*Missouri State M. J., Sept., 1935.

†Compare with illustration in May, 1936, Clin. Med. & Surg., page 232.—Ed.

given once a day and gradually reduced to one to two times a week or longer, depending on the patient. Some of my patients have remained free from pain for as long as two to three months without treatments.

I have used this treatment in 51 cases: 29 cases of osteo-arthritis; 11 cases of rheumatoid arthritis; 2 cases of the Marie-Strümpell type of spine condition; and 9 cases of myositis and neuritis.

Of the 29 cases of osteo-arthritis, 26 or 90 percent experienced definite relief of pain. They were chiefly of the spine and some of them were having symptoms of involvement of the cervical spine, which is ordinarily very troublesome to the patient and very hard to relieve with the usual measures in vogue.

Two cases of Marie-Strümpell disease showed no improvement.

Ten (10) of the 11 cases of rheumatoid arthritis showed definite improvement, both in the relief of pain and lessening of the swelling.

All 9 of the myositis and neuritis cases showed improvement.

How long these cases will go in the future without treatment or what changes in the joints, from a pathologic standpoint, will take place, I am unable to say at present.

This method is certainly not to replace the usual treatment directed to the underlying cause of rheumatism; namely, the correction of foci of infection, metabolic disturbances, etc., but is merely to be used as a means of giving relief of the pain.

Our cases reported were all chronic. I have had no experience in the use of mecholyl in acute joint inflammations or in gonococcal arthritis.

OLIVER ABEL, JR., M.D.

St. Louis, Mo.

Vote next month!

Nembutal in the Treatment of Radiation Sickness

BY chance we found that a patient who had taken pentobarbital sodium (Nembutal) as a hypnotic did not experience nausea following roentgen-ray therapy. Since then, 40 consecutive cases of radiation sickness have been treated with this drug, and the beneficial effects were very marked, although they were not uniformly present. Symptoms were completely controlled in the majority of the cases; relief and amelioration of the severity of the distress occurred in others; and there was a relatively small percentage who were either not benefited, or intolerant of the drug. One case presented an idiosyncrasy toward it.

Nembutal is best administered about one hour before the beginning of treatment. The dose is from ½ to 3 grains (30 to 200 mg.), according to the symptoms of the patient. If nausea and vomiting are present prior to the treatment, suppositories containing 2 grains (128 mg.) each are just as efficient.*—DRS. G. E. RICHARDS and M. V. PETERS, in *A. J. Roent.*, Apr., 1936.

Look for THE LEISURE HOUR among the advertising pages at the back.

BOOKS

Bowman: Massage

THE MASSEUR'S COMPANION. A Concise Survey of the Medical and Surgical Conditions Amenable to Massage, with an Explanation of the Actual Massage Treatment Indicated. *By Arthur J. Bowman, M.I.C.M., B.P.A., M.B.A.Ch. London: Actinic Press Ltd. 1936. Price, $1.60, bound leather cloth; $1.35, paper boards.*

This pocket-sized volume of 95 pages appears to be a transcript of notes made in the author's note book, with little or no digestion or coordination. The information given is fragmentary and there are no illustrations, so that it will be of little help to those who are not already familiar with the technics of massage. All even-numbered pages are left blank, for the readers' personal notes. The blue paper on which it is printed detracts from its legibility. It should be really helpful to trained masseurs, as its title indicates.

NEWS

Ultraviolet Rays Sterilize Air

DRS. W. F. Wells and H. W. Brown, of the Harvard School of Public Health, have proved, as reported in *Science* for July 17, 1936, that the virus of influenza can be suspended in the air, in an infectious form, for an hour or more; also that the virus-containing droplets so suspended can be sterilized by irradiating the infected air with a cold-quartz, mercury-vapor lamp giving off ultraviolet rays.

One article in a recent number of CLINICAL MEDICINE AND SURGERY was worth the price of a year's subscription.—W. G., M.D., Arkansas.

*In the *Proc. Staff Meet., Mayo Clin.* for Apr. 1, 1936, Dr. W. C. Popp tentatively confirms this general statement, but recommends that the Nembutal be always given by rectum, so that, if the patient *does* vomit in spite of it, the disagreeable taste of the drug will not add to his distress. He gives the dose immediately after the x-ray treatment.—ED.

A LIVING FOR THE DOCTOR

(The BUSINESS of Medicine)

Value Received

IN the drawing up of any contract involving the interchange of money, it is the custom, supported by legal decisions long since rendered, that the words, "For value received," must be incorporated in the terms of the agreement. It is also implied in all interchanges of money, and a failure to carry out this implied provision leaves open an opportunity to take action of a legal character on the basis of obtaining money under false pretense.

This brings us to a consideration of the fees charged and the fees received for medical service. The broad general statement that the doctors charge too much for this, that, or the other service is one which the public appears to like to cultivate and expand into propaganda which, if left to take care of itself, cannot but be productive of considerable harm to the public—not to the doctors. The doctors will continue to give the best they know how to give. It may not be the same best in every instance, but insofar as the fellow goes who is giving it, it will be his best.

Now then, where does the public come in? If the public thinks, or is made to think by various propagandists, that it is paying too much for its medical care, it will select the cheap kind on its own initiative, and that will be just the same as it has always been—the self-administration of patented and proprietary medical nostrums. In proof of this, study the financial statements of any of the manufacturers of the well-advertised nostrums that greet you over the radio every hour of every day.

The medical service available at the present day is very elaborate. The degree of its expansion over that of the horse-and-buggy era is simply astounding. The amount of service received by the patient per dollar expended is equally staggering. The facility with which a patient may get to a physician's office or the physician may reach a patient's home provides a very simple illustration of the great improvement in medical service. One may, with little difficulty, assume that such rapid contact of patient with physician alone may eliminate many service calls that could be possible were that contact delayed for an indefinite period, as it one time was. The rapid completion of laboratory tests, also a time and health saver, has made possible a saving in cold cash to the sick public to an incredible amount. The average number of sick days per annum accredited to the industrial working population has been cut down almost a third from what it was when the health insurance study was made before we entered the War, but few have tied this up with the improvement in medical service. It would seem, therefore, that the patient has had for his dollar "value received."

The question naturally arises whether this same public, now so well educated, by the various methods in vogue, as to medical service, would care to entertain a return to the horse-and-buggy days and accept the kind of treatment then available, and at the same fees. There is no question but what the doctors would be much better off financially with such a set-up. Education was cheaper then and they did not have to bother about going to medical societies to keep up to date and they did not need to bother with so many books or magazines. The net profit out of each dollar would be larger, and altogether the doctor would be sitting high on the highside.

The sponsors of the "abundant life" should know that, when the intrinsic value of the dollar drops, its purchasing power becomes less; but they should also bear in mind that the principle of value received throws another light upon this economic problem. The question after all is—how good is the medical service? If it is good, the cost is negligible, as compared with the benefits that follow. It therefore becomes our duty to continue to give the best possible medical service, and follow it up with telling everybody how good that service really is, not sit idly by and allow someone to say that all it amounts to is, "it costs too much!"—Editorial in *Weekly Roster and Med. Digest* (Philadelphia) Mar. 7, 1936.

The Advertisements are NEWS! Read and use them.

Vote next month!

An Antidote to Demogoguery

(More Facts Against Fallacies)

THE "share the wealth" shouters fail (or refuse) to recognize the fact that the wealth of this country is *already* distributed astonishingly widely.

The national income figures for 1935, which are now available, show that 53½ billions of dollars were paid out in this country during that year. Of this, the huge sum of 36 billion dollars (more than 67 percent) went to millions of workers, in wages and salaries. The farmers received more than 8 billion dollars.

In contrast to these immense payments to workers, only 7⅓ billion dollars (less than one-seventh of the whole) was paid to *all* holders of stocks, bonds, notes, and mortgages (hundreds of thousands of whom were also workers), in the form of dividends or interest. That entire amount, including what was received by poor widows, as well as by the rich, would not have paid the expenses of the Federal Government for that year, to say nothing of those of the state and local governments.

Moreover, out of that 7⅓ billion dollars come nearly all of the endowments for colleges, hospitals, and the like, as well as a handsome proportion of the charitable contributions which support thousands of aged and dependent persons.

People with incomes of $50,000 a year or more are considered "ultra-rich"—"millionaires." There were 38,889 of these in 1929; but in 1934 there were only 7,964 of them, and their share of the total income of the country was slightly less than 2 *percent*.

Killing and eating the people who get 2 percent of the national income (out of which they keep many of our colleges, hospitals and other charitable institutions going) will hardly fatten those who receive the other 98 percent of the national income.

AN AMERICAN THINKER.

Look for FACTS AND COMMENTS among the advertising pages at the back.

BOOKS

Peek and Crowther: Facts of the A.A.A.

WHY QUIT OUR OWN? *By George N. Peek with Samuel Crowther. New York: D. Van Nostrand Company, Inc. 1936. Price, 50c.*

The Agricultural Adjustment Act and the various activities growing out of it have had, and may well have, such a profound influence upon all the people in any way connected with agriculture (including the physicians in the smaller towns and rural districts), that no such person can afford to be ignorant of the facts which form the background of the preparation, passage, and administration of that Act, and of the implications for the future which these facts hold.

It is obvious that no one can be more intimately conversant with these facts and their implications than the man who was appointed to administer that Act—George N. Peek, the senior author of the book—who, as he himself says, is "in politics for agriculture; not in agriculture for politics," and the statements which he makes (many of which can be authenticated from official documents) will be startling if not horrifying to most of the people affected, directly or indirectly, by this piece of legislation. Among the mildest of these statements is this pertinent one: "As the A.A.A. began to expand as a social reform instead of as a farm aid, it became inevitable that in time the farmers would own their farms in name only and that, in fact, they would be hired hands of the Federal Government."

Here one can read, in full detail, simply and directly stated, the development of those un-American policies which finally forced a sturdy patriot like Peek to sever his connection with the group which, under cover, was leading or driving the people of this country into Communism.

Those who have had the privilege of reading the highly important book, "America Self-Contained," by the junior author, Samuel Crowther, which was reviewed in this Journal in January, 1934, page 52, will need no further assurance of the sincerity and authenticity of the statements made.

Every voter in the rural districts of this country, and all whose life and work have even a remote connection with agriculture, should read this book carefully between now and November, in order to be able to cast their ballots intelligently and in full knowledge of the probable consequences.

CIVILIZATION AND EMPLOYMENT

The only way by which employment can be provided is by the increase, not by the decrease (as planned by the Communists), of civilization; by multiplying needs, not by reducing the standard of living.—NESTA WEBSTER.

THE SEMINAR

"A MONTHLY POSTGRADUATE COURSE"

(NOTE: Our readers are cordially invited to submit fully worked up problems to the Seminar and to take part in the discussion of any or all problems submitted.

Discussions should reach this office not later than the 5th of the month following the appearance of the problem.

Address all communications intended for this department to The Seminar, care CLINICAL MEDICINE AND SURGERY, Waukegan, Ill.)

Problem No. 8 (Surgical)

Presented by Dr. F. A. Northrup, Pierre, So. Dak.

(See CLIN. MED. & SURG., Aug., 1936, p. 408)

RECAPITULATION: A man, 56 years old, sought treatment on June 5, 1935, on account of a lump, the size of a split pea, on the inside of his left cheek, which had been there for six months or more but of late had been growing more rapidly than formerly. The little tumor was not painful, but was slightly tender to pressure.

The patient had always been entirely well, so far as he knew, and had suffered no loss of weight or vitality. There were no bad teeth near the growth, and no swollen glands. His mother and two aunts died with cancer.

Requirements: What advice would you have given this man and what would you have done for him?

Discussion by Charles F. Geschickter, M.D. Baltimore, Md.

The patient with the pea-size lesion on the buccal surface of the left cheek is a male, 56 years of age. He is, therefore, in the cancer age and of the right sex, since intra-oral carcinoma is nine times as frequent in men as in women. However, various possibilities present themselves.

If the mucous membrane is indurated, ulcerated, or presents papillary projections, the probability is that this is an epidermoid carcinoma. This would be increasingly probable if areas of leukoplakia appear elsewhere in the mouth and if the lesion is opposite the occlusal surface of the molar teeth—a favorite site for buccal carcinoma. However, if the lesion is submucous in location and overlaid by apparently normal mucous membrane, the nerve, vessels or mucous glands of the cheek may be the seat of the trouble. Aberrant salivary tumors, benign in character, or basal-cell cancer may arise from the mucous glands of the cheek or palate. This may be such an aberrant salivary tumor. On the other hand, if it is blue or cystic in character, it may be a benign angioma, which is also common in this location. In rare circumstances, a nerve sheath tumor, a lipoma, a fibroma, or a myoblastoma of the buccal muscle may be found.

If the lesion is in the course of Stensen's duct, if there is interference in salivation or pain with mastication, a calculus of the parotid duct may be present. This can be ruled out by taking an x-ray picture of the cheek.

If a salivary calculus can be ruled out by clinical examination and by roentgenogram, then a diagnosis must be made by biopsy. The lesion should be completely excised, with a margin of normal mucous membrane, and subjected to microscopic study. Further procedures would be determined by the microscopic findings.

Discussion by T. H. Maday, M.D., Chicago, Ill.

In Problem No. 8, Dr. Northrup gives us very little information regarding the growth on the inside of the cheek, so it will be necessary to enumerate all the possible lesions, their diagnosis and treatment.

In the first place, because of the age of the man—56 years—a biopsy is a proper procedure.

The first possible lesion is the formation of a *stone in Stensen's duct,* which usually will suddenly flare up in a marked inflammatory reaction. The diagnosis is established by the site of the lesion opposite a premolar tooth. Probing will elicit signs of a stone. The x-rays may help in determining its location. *Treatment:* A small incision over the mucosa and duct and freeing of the stone.

Second, *leukoplakia,* characterized by piling up of epithelium, with a milky-white appearance. This hardly gives any symptoms. *Diagnosis:* Pearly-white appearance and chronicity. Must be distinguished from syphilitic lesions. When much thickened, malignant disease must be suspected. *Treatment:* Patches may be removed by the cautery or x-rays, but always tend to recur.

Third, *cysts,* usually the size of a wheat grain, but often larger, are seen in the mucous glands of the cheek and lips. They are spherical, firm masses, which glide freely about. Their bluish contents shine through their walls. *Diagnosis:* encapsulated masses. *Treatment:* Excision, sac and all.

Fourth, *papillomas,* which are soft and pedunculated and tend to be caught between the teeth. When larger, they interfere with mastication. *Diagnosis:* Soft, pedunculated or flat lesions, similar to those of the skin, make them easy to recognize. *Treatment:* Best by excision at their base, with a cautery or diathermy needle.

Last, but not least by any means, *carcinoma,* usually adjacent to a ragged tooth; usually papillary and may spread over the entire surface, which is rough and cauliflower-like, but does not bleed very easily. *Diagnosis:* Biopsy is of value here, as these lesions have to be differentiated from tuberculosis. *Treatment:* When seen early, excision or destruction by the electrocautery or diathermy, and radium exposure later. When seen later, radium offers the best hope, especially if the regional lymph nodes appear in the least affected.

Discussion by Leon Reznikoff, M.D., Secaucus, N.J.

The only thing to do in this case is to have a biopsy of the involved tissue, and a pathologic examination to determine the character of the new growth, whether it is benign or malignant. The treatment, of course, would be in accordance with the laboratory findings. I assume that a thorough physical examination was performed, and laboratory work, including a Wassermann test, was done, and that all the findings were negative except for the lump mentioned in the problem.

It should be cautiously explained to the man that he has no need to become unduly alarmed, but that the best procedure would be to perform a biopsy and keep him under observation. He should be told that, although there is no definite indication of malignant disease, the only way to rule out any such possibility is through microscopic examination of the tissue. The importance of early diagnosis of malignant conditions should also be explained to him.

Should he persistently refuse biopsy, the doctor should at least insist on a consultation with another physician.

Discussion by John B. Woodville, Sr., M.D., Lansing, W. Va.

Growths appearing about the face with no demonstrable cause, even when they give rise to no symptoms, are a source of uneasiness to the patient and concern to the physician who is called upon to classify and differentiate them, and to decide between a course of immediate action or of watchful waiting.

The rapid growth of this little tumor has convinced the patient of the wisdom of seeking medical advice, although the size of a split pea, over a period of six months, does not indicate a rate of growth that should excite alarm. The important point here to decide is, whether the condition is benign, with the probability of its so remaining, or is it premalignant?

Points in favor of the first hypothesis would be a normal appearance of the mucous membrane covering and surrounding the tumor, movability, and absence of adenitis. Indicating the possibility of present or future malignancy, the age of the patient and the family history of cancer should receive especial consideration. In addition to this, if the mucous membrane is unduly red and swollen, with the capillaries injected and dark-red or bluish in color, cancer should be suspected, even though no swollen gland be found.

Whatever the nature of the tumor may be, the patient would be in better physical and mental condition if it were removed, and the physician would be relieved from responsibility.

Discussion by Henry Schmitz, M.A., M.D., LL.D., F.A.C.S., Chicago, Ill.

This lesion in the cheek should be considered and treated as a cancer until absolutely proved otherwise. Complete excision and microscopic examination should be made immediately, and if found to be cancer the treatment should include a thorough radiation with high-voltage x-rays to both sides of the neck and the cheek. If it is a benign tumor, the wide surgical excision which was done to establish the diagnosis will suffice for a permanent cure. A blood Wassermann test should not be neglected.

Discussion by G. M. Russell, M.D. Billings, Mont.

It is not probable that this "lump" was a stone in Stensen's duct, or the patient would have had pain. Neither the consistency nor the exact location of the tumor is given. Apparently no x-ray picture was taken.

I would have done a biopsy, to determine the nature of the growth. If it had proved to be benign, I would have excised it; if malignant, I would have advised x-ray or radium treatment.

Discussion by John Clark, M.D. Independence, Kans.

There are six types of tumors to be considered in connection with this problem: cancer; gumma; tuberculosis of the parotid gland; fibroma; mucous cyst; and cavernous angioma of the mucous membrane of the cheek.

Assuming that all of the physical findings have been presented, can cancer be excluded? The patient is in the cancer age; he is in the hereditary line for cancer; the tumor is tender to the touch and is growing; it has been noticed for six months. Two prime conditions which go along with cancer are wanting. The doctor tells us that there are no enlarged glands nor loss of weight or vitality. He does not mention the consistency of the tumor—whether it is hard or soft, or lobulated. Sometimes these three factors are slow in appearing in cancer, but cancer cannot be excluded here.

Gumma and tuberculosis should be kept in mind. If evidence of either or these conditions was present, the doctor would have given us some clue. I see no such evidence.

Three types of tumor are common to this area. The first type is fibroma. Size does not have much to do with tumors of this sort, at the start, but the color does, and so does the feel of the tumor. It is soft to the feel and is the color of the mucous membrane, and it cannot be dispelled on pressure.

The second type is a mucous cyst, which also does not disappear on pressure. Its color is not that of the mucous membrane, but is a bluish tint. It is round or ovoid in outline.

A third type is the cavernous angioma, which can be dispelled on pressure. Its color is a bluish red.

From the doctor's description, I see nothing that would suggest any of these tumors in this case. This drives us back to the question of cancer. Six months would hardly suffice for enlarged glands to appear, particularly if the tumor is in the parotid gland. The absence of enlarged glands would account for the sustained weight and vitality. Cancer is my tentative diagnosis in this case.

Solution by Dr. Northrup

I coagulated the growth with a high-frequency current and gave the patient an ordinary mouth wash, to be used three times a day.

I advised him that, with a family history like his, he would have to be more careful than a person with a similar growth but a different history, and must keep in touch with me and see me frequently, so that I could watch the case.

In ten days, the lesion was healed and the inside of his mouth was entirely smooth. He has had no signs of recurrence and has been in perfect health ever since—now nearly a year.

In addition to the local treatment I directed him to eliminate meat from his diet (on account of the putrefactive products it may produce in the intestine) and to reduce salt (sodium chloride) to a minimum, because I am convinced that, in malignant conditions, the salts of potassium, calcium and magnesium are greatly reduced or absent, while those of sodium are present in excess. Treatment of several malignant cases along this line has given encouraging results, leading me to believe that remineralization is an important factor in the management of such cases.

Problem No. 10 (Surgical—?)

Presented by Edmund Lissack, M.D., Concordia, Mo.

THE patient was a well-developed but rather thin young woman of twenty-two years; an orphan who knew nothing of her family history. She had always menstruated normally and regularly.

In July, 1934, she noticed that the menstrual periods were increasing in length and in the amount of flow, and took some medicine (nature unknown) which gave her some relief.

In July, 1935, the menorrhagia again became pronounced, the periods lasting for from ten to twenty days and generally requiring about 36 pads. Many clots were passed, and there was some pain in the left side during the first two or three days of the period, but not at other times. Urination was frequent at these times, but without pain or burning. Some leukorrhea was present a few days after menstruation, but no unpleasant odor. She often had headaches.

Physical Examination (thorough) showed no abnormalities except a functional heart murmur, slight emaciation, and a hard, smooth mass in the lower abdomen, more or less fixed in the pelvis and giving a uterine bruit on auscultation. The temperature was 98.6° F.; pulse, 74; blood pressure, 120/80; urine, normal; *blood:* Hemoglobin, 52 percent; red cells, 3,790,000; leukocytes, 10,950; coagulation time, 3 minutes; Wassermann test, negative.

Requirements: Suggest diagnosis (giving reasons) and treatment.

COMMUNISM AND SOCIALISM

Socialism is communism in its working clothes. Communism is Socialism in its fighting clothes. The only difference between the two is a difference of the method and the pace. Socialism seeks to achieve by the ballot what Communism strives for by bullets. Communism is merely Socialism in a violent hurry.—Editorial in* Chicago Leader, *July 31, 1936.

CLINICAL NOTES and ABSTRACTS

Technic of Intravenous Anesthesia*

THIS note describes the methods we use for injecting intravenous anesthetics such as Evipal and Pentothal. These can be given in one of three ways: as a single dose; in repeated doses; and by continuous intravenous infusion.

1.—*Single dose:* The sterilized syringe having been loaded, a dental prop or Hewer's mouthpiece is inserted between the patient's teeth. The upper part of the arm is constricted, either manually or by a pressure armlet, and the needle inserted into an antecubital vein. Assuming a dose of 10 cc., the first 2 or 3 cc. of the solution is injected in about 15 seconds, during which time the patient is asked to count. He usually becomes unconscious in from 15 to 30 seconds, and a pause is then advisable, for about the same period, so that one may be satisfied that his condition is within normal limits. If the injection is given too rapidly, the pulse-rate rises and the respirations become depressed. The next 3 or 4 cc. should be injected in about 30 seconds. After a further short pause, provided the patient's condition is satisfactory, the remainder of the 10 cc. dose is given at the previous rate. Both the pulse and respiratory rates are constantly observed, a clear airway is maintained, and the jaw is supported throughout the anesthesia.

2.—*Repeated doses:* If a further dose is likely to be wanted, the needle may be left in the vein, and the syringe removed, recharged, and replaced if required. For this purpose Dickson Wright's splint, which controls the forearm, will be found convenient. This has an upper band consisting of a pneumatic bag which can be inflated and deflated by means of a bulb with a release valve attached, and a lower band firmly gripping the wrist. The needle and syringe are fixed to the forearm and kept in place by means of adhesive plaster.

Courtesy, *The Lancet.*

Fig. 1.

3.—*Continuous intravenous infusion:* An ordinary intravenous apparatus is used to convey physiologic saline solution, with 5 percent dextrose, from a flask container to a vein. The solution need not be heated. A dripper, controlled by a simple thumbscrew, is adjusted to deliver not less than 20, and not more than 30, drops a minute. The limb is, with advantage, controlled on a suitable splint. The needle, attached to the syringe containing the intravenous anesthetic, is inserted into the tubing near the vein and the injection given as into the vein (Fig. 1).

In serious cases a patient can, of course, have blood transfusion throughout the operation, with pauses for the anesthetic administration. Similarly, for any emergency, the syringe can be used for giving stimulants, such as Coramine or alpha-lobeline; and here an advantage of the apparatus is that only the smallest amount necessary of the drug need be given, since it is accurately measured and reaches the vein direct. We have found the administration of continuous saline-dextrose infusion during operation of the utmost importance in some of the "poor risk" cases. Dehydration is combated all the time and shock is largely abolished.

RONALD JARMAN, F.R.C.S.
A. LAWRENCE ABEL, F.R.C.S.
London, Eng.

The Lancet (Lond.), Mar. 14, 1936.

Brachial Artery Puncture*

A SAMPLE of blood for laboratory examination is usually taken from the median cephalic or median basilic veins. When these veins are inaccessible, resort must be had to some other venous source. In some instances, total failure ensues because of faulty technic, venous inaccessibility, venous sclerosis, or other causes. Should the required specimen of blood be 50 cc. or more, difficulty may be encountered with unsuitable veins.

For these reasons, I present a simple method of brachial artery puncture, to be used where venous puncture fails. This is not to be construed as a new procedure, since Hurter, Lundsgaard, Stadie and Peters, and Van Slyke have employed it, both for the above reasons and also for studies upon the oxygen and carbon dioxide determinations of arterial blood.

Method

The everted arm is placed in the supine position upon a pillow, so arranged below the elbow that the ante-cubital space is made as prominent as possible. Since the brachial artery lies just medially to the insertion of the biceps muscle, palpation in this area will reveal its position to the operator. The site is cleansed with iodine and alcohol, after which an 18- or 20-gage needle, attached to a 10 cc. syringe, is made ready. The needle should be keenly beveled to a 30-degree angle, so that the arterial wall will be punctured and not nicked, thus lessening the danger of hemorrhage or oozing. Prior to the puncture, 1 to 3 cc. of 2-percent Novocain solution are installed intra- and subcutaneously, carrying the infiltration to the periarterial sympathetic plexus in order to prevent a painful stimulation.

The needle and syringe are then taken in the operator's right hand and the artery is anchored with the first and second fingers of the left hand. The needle is plunged through the skin, immediately after which it is placed at an angle of 45 degrees to the surface and, with a quick, forceful, downward movement, thrust into the artery. The left forefinger serves as a palpatory guide. The strongly pulsating arterial blood flows into the syringe without suction, after which the desired amount may be collected in a suitable container; or bloodletting is satisfactorily accomplished. A tourniquet or clenching of the fist is unnecessary. A small gauze sponge and firm bandage are applied for one hour following the procedure. This precautionary measure prevents bleeding and the formation of a hematoma.

The remote dangers of hemorrhage, aneurysm, embolism, or thrombosis are to be considered as complicating factors. I have met none of these in over 100 punctures, and believe them due to careless or faulty technic. Many patients offer the unsolicited assertion of preference for this method rather than venous puncture.

HAROLD F. ROBERTSON, M.D.
Philadelphia, Pa.

J. Med. Pract., May-June, 1936.

Vote next month!

Dextrose and Caffeine Intravenously in Acute Alcoholic Coma

IT is always advantageous to bring a patient out of acute alcoholic coma with the least practicable delay. This can be accomplished in a highly dramatic manner by the intravenous injection of 50 cc. of a 50-percent solution of dextrose, to which 3 grains (200 mg.) of caffeine sodiobenzoate have been added. The way in which the clammy sweat, the thready pulse, the slow and irregular respiration, and the circulatory collapse clear up in five or ten minutes is astonishing to the beholders. The patient regains consciousness and can walk and talk in a fairly intelligent manner.

This treatment can be given by any physician, anywhere and at any time; the sterile solution, syringe and needle can be carried in the emergency kit; the results are manifest at the end of the injection; it is inexpensive; and it can be used to differentiate alcoholic coma from unconsciousness from other causes.—ETHELBERT F. COX, B.S., M.D., Paris, Ky., in *J. Med. Pract.*, May-June, 1936.

Pneumothorax Therapy*

FEVER, night sweats, loss of appetite, malaise and rapid pulse are manifestations of toxemia. Toxemia may be of low grade, allowing the patient to enjoy relatively good health, or it may be acute and apparently out of all proportion to the extent of the disease. Toxemia makes the patient feel ill and favors the spread of the tuberculosis in the lungs. This spread results in more toxemia. To effect a cure one must first of all break through the vicious cycle and reverse the trend. Check and eliminate the toxemia, and the appetite improves, the fever disappears, and there is a gain in weight and strength. This gives an opportunity for the natural healing forces to come into play and resolution and scar of the pulmonary lesion usually follows.

There is no drug to control the toxemia; rest in bed is not sufficient, in many cases at least, to rest a tuberculous lung. Pneumothorax collapses the diseased area of the lung and shuts off the source of the toxemia.

*J.A.M.A., Apr. 18, 1936.

For this reason the immediate results of pneumothorax are often dramatic. But the lung itself is still diseased. If re-expansion is permitted before healing has taken place, all clinical symptoms of active tuberculosis return.

From three to five years or more are necessary to bring about a lasting cure. The length of time pneumothorax should be maintained depends upon the extent and severity of the disease at the time treatment was instituted. There is no fixed rule; if a general rule may be ventured it would be to continue pneumothorax for at least a year after x-ray evidence indicates complete healing.

In favorable cases (which constitute about 50 percent) the patient may return to work in from one to three months after pneumothorax has been instituted. The ambulatory pneumothorax clinic at the Henry Phipps Institute, organized in 1931 in the heart of the slum district of Philadelphia, where poverty and bad hygienic conditions are common, treats about fifty patients a morning, with results that compare favorably with similar groups of patients treated in well-regulated sanatoriums.

When the diseased lung is satisfactorily collapsed, tubercle bacilli almost invariably disappear from the sputum. A relatively simple procedure, pneumothorax, is, therefore, one of the most powerful weapons in the control of tuberculosis.

Complete collapse of the lung, such as Forlanini envisioned, is not necessary. All that is necessary is collapse of the diseased part, which places little or no strain on the contralateral lung. Selective collapse also makes possible bilateral collapse, which widens the indications for pneumothorax. There are many institutions today in which pneumothorax is applied to 75 percent or more of the tuberculous patients, in marked contrast to the usual 5 to 10 percent of a decade ago.

Pneumothorax therapy has its dangers and complications, but they can be overemphasized. By and large they are not more serious than the complications of passive treatment, and their frequency and severity can be materially reduced by proper technic and management.

J. W. CUTLER, M.D.

Philadelphia, Pa.

Oleothorax

IF pneumothorax is ineffective, surgical collapse of the lung is impracticable, and the cavity to be obliterated is not too superficial, oleothorax is of great value. Sometimes it works even better than thoracoplasty. It is *contraindicated* if perforation is present.

The oil should be injected warm, with air, and in small doses, until the pleura is filled. Mineral oil is absorbed much more slowly than the vegetable oils. Antiseptics may be added, as in gomenol, if indicated. When the purpose of the oil has been accomplished, it should be withdrawn.—DR. JOHN N. HAYES, Saranac Lake, N. Y.

Solutions Used in Fluid Therapy*

THE following solutions are widely used, parenterally, in restoring lost fluids to the body:

1.—*Physiologic salt solution:* This solution, consisting of 0.9 percent sodium chloride, is perhaps the most generally useful. It is isotonic with the blood and neutral in reaction, and may be given by any of the usual parenteral methods. Sodium chloride is absolutely indispensable in the repair of dehydration, owing to the need for maintenance of the proper salt concentration in the body fluids. In fact, one may see the paradoxical spectacle of dehydration with diuresis, where water without sodium chloride is taken in quantity by a dehydrated animal, for the kidney promptly excretes the excess water in order to avoid having the salts of the body diluted to a dangerous degree. In giving physiologic salt solution we must keep in mind the fact that this fluid is readily retained, to the point of producing edema, and the amount given should not be greatly in excess of the body need.

2.—*Dextrose solutions:* Isotonic (5-percent) dextrose solution may be given by vein or by hypodermoclysis, while hypertonic dextrose solutions, such as the 10-percent, or 50-percent solutions, must be given only by vein, for they are highly irritating to the tissues. Hypertonic dextrose solutions are prone to evoke thrombosis of a vein at the point of injection, unless mechanical trauma of the vein is avoided and the venous flow is rapid. Dextrose is rapidly taken up by the liver and muscles after injection into the blood stream and is converted into glycogen or oxidized within a few hours. This leaves its water of solution free for elimination by the kidneys, and hence isotonic dextrose solution has a diuretic effect, which is much to be desired at times in the oliguria of dehydration, for effective renal function is thus promoted. Hypertonic dextrose solutions have an even greater diuretic effect, but are undesirable in treating dehydration, since their first effect is to abstract water from cells already dehydrated.

3.—*Dextrose in physiologic salt solution:* A 2½-percent, 5-percent, or 10-percent solution of dextrose, made up with 0.9 percent sodium chloride, may be useful for intravenous in-

**New Eng. J. of M.*, July 9, 1936.

jection, since water, dextrose, and sodium chloride are all supplied. Such solutions are hypertonic, and thus are best given intravenously, rather than interstitially. Their hypertonicity also renders such solutions less desirable in severe dehydration, since their immediate effect would be to abstract water from cells.

4.—*Sucrose solution, 50 percent:* This strongly hypertonic, nontoxic solution may be given intravenously for the purpose of lowering intracranial pressure. Sucrose, given by vein, is quantitatively excreted through the kidneys, and thus has a strong diuretic effect. It possesses a great advantage over 50-percent dextrose solutions in lowering intracranial pressure, in view of the fact that sucrose does not diffuse into the cerebrospinal fluid as does dextrose with the production of a secondary rise in cerebrospinal fluid pressure.

5.—*Sodium bicarbonate solution, 5 percent:* Occasionally, in treating severe acidosis with dehydration, as in diarrheal disease in infants and in diabetic acidosis, it is advisable to give sodium bicarbonate solution intravenously, as well as physiologic salt solution. A solution of 5 percent sodium bicarbonate in water is hypertonic and alkaline and must be given by vein rather than into the tissues. The great disadvantage that this solution has is the difficulty in sterilization. When heated, such a solution loses CO_2 and becomes changed into the very alkaline, toxic sodium carbonate. Therefore, unless special technic for sterilizing sodium bicarbonate solutions is available, these solutions can be given only without formal sterilization. Sodium bicarbonate may be taken from a fresh bottle of the chemically pure reagent with a sterile teaspoon and added directly to a flask of dextrose solution or physiologic salt solution, which is to be given intravenously, in the proportion of one or two teaspoonfuls per 500 cc. of fluid. Although this practice has the sanction of extensive use, it cannot be wholly commended.

6.—*Sodium Lactate solution, 1.8 percent (1/6 molar):* The use of this fluid, as a substitute for sodium bicarbonate solution, has been extensively advocated by A. F. Hartmann. It has the advantages of being isotonic and neutral, permitting interstitial, as well as intravenous, administration. In addition, its alkalinity results from the gradual conversion of lactate to dextrose in the body, the dextrose being available to meet the body's need. As one of the fluids used in the treatment of dehydration with acidosis, supplementary to physiologic salt solution, this fluid has real merit, particularly in children, in whom interstitial injection may be desirable. Sodium lactate solution is contraindicated in dehydration with alkalosis.

7.—*Acacic solution:* This solution, consisting, as usually given, of 6 percent gum arabic (U. S. P.), made up in 0.9-percent sodium chloride solution, has a limited usefulness in the treatment of conditions of acutely reduced blood volume, such as shock and hemorrhage, when blood transfusion cannot immediately be done. Acacia forms a colloidal solution which leaves the blood stream very slowly and therefore tends to hold fluid in circulation. It should be run into a vein slowly, not exceeding 20 cc. per minute. Dangers are: injury to the hepatic parenchyma, with enlargement of the liver and diminished excretion of bile salts and pigment, and diminution in urine volume. Repeated injections are much more apt to cause harm, particularly from depression of serum proteins and damage to the polygonal cells of the liver. In an emergency, however, when it is not possible to give a blood transfusion immediately, the intravenous injection of acacia solution may be regarded as a temporary substitute. Its use is more justifiable in shock than in severe hemorrhage.

8.—*Blood:*—Blood, as given in transfusion, is obtained from a compatible donor and is injected in quantities varying from 400 to 1200 cc. in an adult. Whole, unmodified blood may be given from a parafinnized container; or, blood may be citrated and injected more slowly. Citrated blood is somewhat more likely to produce untoward reactions, but possesses the advantage of being much simpler to give. Indeed, such blood may be infused into a vein using the ordinary intravenous infusion technic and may be allowed to run in quite slowly. Blood which has been defibrinated, as by stirring or shaking with glass beads in order to remove the elements of the clot, should never be used for transfusion, since toxic substances are formed in such traumatization. This is one of the reasons why autotransfusion of blood which has collected in the peritoneal cavity is undesirable.

JOHN D. STEWART, M.D.
Boston, Mass.

Treatment of Sprains by Intraligamentary Injection of Novocain*

DURING the past few years we have treated all mild sprains by the intraligamentary injection of Novocain, with consistently excellent results. The traumatized joint usually responds quickly to treatment, often requiring but a single injection, and relief is permanent.

The technic consists of the injection of from 10 to 20 cc., according to the importance of the articulation, of a 1-percent solution of Novocain in the region of the traumatized

*Am. J. Surg., April, 1936.

ligament. The point designated for the injection is the spot of maximum tenderness, but care is also taken to inject the ligament itself. A fine needle and an ordinary syringe are used. Ligaments of the knee, wrist, ankle, and shoulder are usually easy to locate. For the hip the injection is more difficult. For this articulation the large vessels are avoided by introducing the needle to the neck of the femur, withdrawing it about 1 cm. and then making the injection. If a single injection does not suffice, repeated infiltrations are made during the subsequent few days. Accidents in using this technic have never caused alarm. In order to be certain that the anesthetic is not injected into a blood vessel, one must withdraw the plunger of the syringe, or be certain that no flow of blood comes from the inserted needle. There is increased pain for one or two hours after the injection, then relief.

This method is indicated in all types of ligamentary sprains in which no fracture or torn ligament can be demonstrated. Sprains may be treated at all stages of development, but the results are most satisfactory in the early stages. The method has given the best result in articular impotence as the result of a sprain, in the after effects of sprains, and following joint operations. A supply of Novocain and the materials necessary for its injection should be kept ready for use in every athletic center. By this treatment the suffering and time lost with sprains can be saved at little cost.

RENE LERICHE, M.D. and
G. ARNULF, M.D.
Strasbourg, Lyons.

Vote next month!

Immunotransfusion in Undulant Fever

IMMUNOTRANSFUSION has given good results in the treatment of two cases of undulant fever. The presence of immune bodies in the blood of the donor was determined by the opsonocytophagic index (Huddleson: *A. J. Pub. Health*, Sept., 1933). One transfusion of 500 cc. of blood was given to each patient treated.—DRS. S. M. CRESWELL AND C. E. WALLACE, in *J. A. M. A.*, Apr. 18, 1936.

Metrazol in Shock and after Anesthesia*

IN a series of 250 cases, Metrazol was used for two purposes: (1) To overcome shock and depression of the circulation and respiration; and (2) to shorten the period of anesthesia or hypnosis after Avertin.

In shock, the usual dose is 1 to 2 cc., injected intramuscularly every 1 to 3 hours, according to the conditions, for from 24 to 48 hours. The intravenous or subcutaneous administration of fluids (isotonic saline or dextrose solution) is a highly valuable adjunct.

In cases of collapse or cessation of respiration during general anesthesia, the *intravenous* injection of from 2 to 5 cc. of Metrazol is a valuable addition to the methods used for resuscitation.

Avertin is a vasomotor respiratory depressant, and the postoperative sleep following its use is sometimes alarmingly prolonged. If 2 cc. of Metrazol are injected intramuscularly, immediately after operations performed under this anesthetic, regular and satisfactory heart action and breathing are assured and the postoperative hypnosis is reduced about 75 percent.

KARL SCHLAEPFER, M.D.
Milwaukee, Wis.

*Anesthesia and Analgesia, July-Aug., 1936.

Indications for Lumbar Puncture*

IN my opinion, any disease or abnormal condition that shows any symptoms whatsoever referable to the central nervous system should receive the benefit of a lumbar puncture to ascertain definitely the pressure and the chemical attributes of the spinal fluid. There is no more harm to be expected from such a diagnostic puncture than there would be of catheterizing the bladder, if as much. The information to be gained through a lumbar puncture may mean the difference between health and death to the patient. The physician and the patient have everything to gain and nothing to lose through such a diagnostic procedure.

Among the more common conditions met with in general practice where the diagnostic lumbar puncture should be carried out are: All forms of suspected meningeal irritation; all forms of meningitis; all traumas of the skull that might possibly be associated with concussion; all uremic states associated with central nervous symptoms; all cases of eclampsia; all suspected poison states; all prolonged and unexplained headaches; all cases of suspected hysteria, neurasthenia and psychasthenia; all psychotic states, from dementia precox to senility; all epileptic conditions; all mental deficiencies; all patients showing criminal tendencies; all alcoholics and all "dope" addicts; all delirious and coma states. In other words, in every condition wherein it can be demonstrated that the central nervous system may in any way be involved in the disease process.

This may seem to be a large order and covering too much territory, but if the gen-

*J. of Med. Pract., Mar., 1936.

eral practitioner will keep these indications in mind and faithfully carry out the lumbar puncture as a part of his routine examination of the patient, he will be surprised at the results in terms of a better knowledge of the disease process and consequently an improved technic in treatment of the case.

In every case where the diagnostic lumbar puncture reveals an abnormal increase in the pressure of the spinal fluid, as much of the fluid should be removed as seems to be indicated to bring it down to the normal, or near normal, pressure level. If the amount of fluid to be removed exceeds 40 cc., then air should be introduced in equal amounts for every cc. removed above the 40 cc. withdrawn. The only possible condition wherein this rule may not be applicable is where there is a likelihood of a cerebral hemorrhage, and the removal of the fluid may invite additional hemorrhage through removal of pressure. The brain tumor possibility—that is, the one in the silent area of the brain, which one might strike once in a million times—is very small, and in case it is your luck to hit one of these cases, and the patient collapses or becomes unconscious during the lowering of the spinal fluid level, then the only thing to do is to stand the patient on his head, and the symptoms will clear up.

H. H. McCLELLAN, M.D.

Dayton, O.

Dextrose for Intravenous Infusions

THE frequent necessity for more or less large intravenous infusions is steadily becoming more widely recognized. The possibility of postoperative edema when excessive amounts of isotonic saline solution are used in this way, has been demonstrated. The advantages of using dextrose solution for routine intravenous infusions, and of employing salt solutions only when sodium chloride is specifically indicated, is apparent.—FREDERICK A. COLLER, M.D., Ann Arbor, Mich.

Hypertonic Dextrose Solution

GIVEN intravenously before operation, to patients with low blood pressure and myocardial insufficiency, a 50-percent solution of dextrose decreases the risk of the anesthesia and the operation. Given postoperatively, it raises the blood pressure, strengthens the heart action and facilitates the absorption of saline solution given hypodermically. After a sudden hemorrhage it may carry the patient along until a transfusion can be given. —DRS. H. B. MATTHEWS and V. P. MAZZOLA, Brooklyn, N. Y.

Anterior Saphenous Vein for Intravenous Injections

THE anterior saphenous vein is well adapted, because of its size and superficial location, to isolation by direct exposure, when giving blood, dextrose, or saline solutions or medication by the intravenous route, to infants or to adults whose superficial veins are small or otherwise unsuitable. At the ankle it is regularly found about one centimeter anterior to the internal malleolus. A small scar in this location is entirely inconspicuous.—*Therapeutic Notes* (P. D. & Co.), July-August, 1936, p. 207.

The Advertisements are NEWS! Read and use them.

Dosage of Gonococcus Bouillon Filtrate

IN addition to the directions that accompany each package of gonococcus bouillon filtrate, added experience has enabled me to make the following suggestions as to dosage:

The size of the first dose is in direct proportion to the duration of the infection: First week, 0.10 cc.; second week, 0.15 cc.; third week, 0.20 cc.; etc. However, never commence treatment with an initial dose larger than 0.20 cc. in a chronic case.

Following the first dose, the size of the local cutaneous reaction should be used as a guide to future doses. If the local tissue reaction after 24 hours is only 2 inches in diameter, increase the dose after seven days by 0.10 cc.; if the local tissue reaction is from 2 to 3 inches in diameter, do not increase the dose until the reaction after 24 hours is 2 inches in diameter or less; if the local tissue reaction is over 3 inches in diameter after 24 hours, *decrease* the dose by 0.10 cc.

In order to determine the size of the local tissue reaction after 24 hours accurately, it is suggested that the patient trace the size of the inflammatory area with tissue or toilet paper, bringing the tracing to the doctor at his or her next visit.

Reactions are less severe following the cutaneous administration of bouillon filtrate if the injections are placed on the arms or anterior surface of the torso.

Using the size of the cutaneous reaction as a guide to future doses, it is advantageous to step up the dose, often as high as 0.40 to 0.50 cc., repeating the last dose at least twice after the patient is free from gonococci.

BUDD C. CORBUS, M.D., F.A.C.S.

Chicago, Ill.

DIAGNOSTIC POINTERS

Epigastric Percussion in Peptic Ulcer

IN suspected cases of peptic ulcer, gentle percussion over the upper abdomen, made with a reflex hammer having a triangular rubber head, using short, rapid strokes and approaching the epigastrium gradually, will in *positive* cases, elicit definitely localized pain over a small area in the mid-epigastrium or 1 to 2 cm. to the right of the mid-line. In *negative* cases, the patient will fail to wince or will point to *many* areas of pain.—Drs. J. Meyer and J. S. Golden, in *A. J. Digest. Dis. & Nutrition*, Mar., 1936.

Obstructive Jaundice

JAUNDICE may be caused by compression of the common bile duct by disease of the pancreas or its ducts.—Dr. Waltman Walters, Mayo Clinic, Rochester, Minn.

Hypothyroidism

LOOK for hypothyroidism in all children who show: (1) physical or mental retardation; (2) signs resembling cretinism, but less marked; (3) delay in ossification of the epiphyseal centers (shown by x-rays); (4) a low basal metabolic rate (if this can be taken); or (5) failure to respond to ordinary treatment for obscure conditions.—Dr. Geo. B. Dorff, in *J. Pediat.*, June, 1935.

Retropharyngeal Abscess

RETROPHARYNGEAL abscess in children may be mistaken for laryngeal obstruction, enlarged adenoids, acute tonsillitis, spinal meningitis, pneumonia, and cervical orthopedic conditions.—Lyman G. Richards, M.D., Boston, Mass.

Danger of Sebaceous Cysts

STATISTICS show that from 2.2 to 9.2 per cent of sebaceous cysts become malignant; therefore all recurrences after operation for sebaceous cyst, particularly if the cyst is ulcerated, should be studied histologically and given thorough treatment with x-rays or radium.—Drs. M. J. Stone and E. A. Abbey, in *Arch. Dermat. & Syph.*, Apr., 1935.

Alcoholic Subintoxication

ALCOHOL, in amounts corresponding to 2 or 3 ounces (60 to 90 cc.) of whisky, usually interferes with rapid and accurate coordination and impairs mechanical skill and intelligence (though the subject *feels* particularly keen and able), and must be a considerable factor in automobile accidents.—Committee of British Medical Association, in *J. A. M. A.*, Oct. 5, 1935.

Psychic Conflicts

IN the neuroses and psychoneuroses the sex factor is important, because a powerful urge comes into conflict with the restraints of social life, but it is by no means the cause of all psychic disorders. Self-preservation may cause even worse conflicts. Fears of all kinds (not merely of death) are universal among men, and may be as potent as the sex urge. Greed is another cause of conflicts. We disguise these unlovely emotions with pretty words, and forget what they really are.—Dr. Louis Casamajor, of St. Louis, Mo.

Indigestion

DISTRESS coming on immediately after eating is not due to the nature of the food but to the way it was eaten—too fast or in a condition of worry, fear or other stress. In such cases, do not change the diet, but order quiet, rest and relaxation, before, during and after meals.—Drs. W. C. Alvarez and H. C. Hinshaw, in *Proc. Staff. Meet. Mayo Clin.*, Feb. 13, 1935.

Dementia Precox

A FEELING of unreality is the cardinal symptom in dementia precox (schizophrenia). Hallucinations and delusions are secondary symptoms. Psychotic conduct is symptomatic; it represents the patient's personal reactions to this subjective distress.—Dr. C. S. Bluemel, in *Colorado Med.*, July, 1935.

Traumatic Neuroses

TRAUMATIC neuroses do not occur when a man is working for himself.—Dr. Louis Casamajor, of St. Louis, Mo.

NEW BOOKS

Any book reviewed in these columns will be procured for our readers if the order, addressed to CLINICAL MEDICINE AND SURGERY, Medical & Dental Arts Bldg., Waukegan, Ill., is accompanied by a check for the published price of the book.

The writings of the wise are the only riches our posterity cannot squander.—LANDOR.

Herrmann: Diseases of Heart and Arteries

SYNOPSIS OF DISEASES OF THE HEART AND ARTERIES. *By George R. Herrmann, M.D., Ph.D., Professor of Clinical Medicine, University of Texas, etc. With 88 Text Illustrations and 3 Color Plates. St. Louis: C. V. Mosby Company. 1936. Price, $4.00.*

This synopsis is an attempt to provide an acceptable indexed epitome of the principles and modern conceptions of cardiologic practice. Written by an experienced teacher, it is intended primarily for the student and the assiduous, conscientious practitioner who, owing to the multiplex requirements of present-day crowded curriculums or the exigencies of a general practice, cannot find the time necessary to study the details of elaborate textbooks.

The main facts regarding diseases of the heart and arteries, drawn from standard works and illustrated by original and selected drawings, are presented here in sufficient detail so that, as the author hopes, the essentials are furnished to provide the service required by those for whom the book is intended.

The synopsis should also prove of value to those who lecture on cardiology; while there is little that is original, all modern developments in the science are touched upon.

Wolf: Endocrinology in Modern Practice

ENDOCRINOLOGY IN MODERN PRACTICE. *By William Wolf, M.D., M.S., Ph.D. Illustrated. Philadelphia and London: W. B. Saunders Company. 1936. Price, $10.00.*

This book contains 1,018 pages, weighs over four pounds, and contains no bibliography. It is divided into thirty-six chapters. One is devoted to introduction; sixteen to the pituitary, ovaries, testicles, thyroid, adrenals, parathyroids, thymus, pineal, mammary glands, pancreatic islets, other hormones, obesity, menstrual disorders, the menopause, pregnancy, and sterility. At the end of each chapter is a good summary. The endocrine aspects of non-endocrine diseases are discussed in ten chapters; endocrine diagnosis in seven chapters; and endocrine preparations in two.

The author has attempted a very laudable procedure in discussing the endocrine aspects of non-endocrine diseases. Unfortunately, it is too large a field to be covered in the space devoted to it and consequently the discussion is rather superficial.

Under endocrine diagnosis he discusses the interpretation of laboratory findings and the choice and description of diagnostic procedures. These are two very worthwhile chapters, and their careful perusal should lead the clinician to a more intelligent selection and interpretation of laboratory work, with considerable advantage to both himself and his patient.

Unfortunately, the book contains many statements, apparently expressions of the author's opinion, which are not supported by adequate data, nor are they so labelled that men not familiar with this special field of medicine may recognize them for what they are and govern themselves accordingly.

The book represents a tremendous amount of work and is a worthwhile addition to endocrine literature, although the same amount of information might well have been contained in a book two-thirds the size.

J. H. H.

Mercer: Orthopedic Surgery

ORTHOPEDIC SURGERY. *By Walter Mercer, M.B., Ch.B., F.R.C.S. (Edin.), F.R.S. (Edin.), Assistant Surgeon, Royal Infirmary, Edinburgh; Surgeon, Chalmers Hospital, Edinburgh, etc. With a Foreword by John Fraser, M.C., M.D., Ch.M., F.R.C.S.E., Regius Professor of Clinical Surgery in the University of Edinburgh. Second Edition. Baltimore: William Wood & Company. 1936. Price, $10.00.*

This work is based upon the lectures given by the author at the University of Edinburgh, and this new (second) edition has taken in so much new material that 200 pages and 37 additional illustrations have been added. This new material includes two chapters on circulatory disturbances of the extremities and manipulative surgery, and sections on congenital deformities, syphilis of the bones and joints, hemophilic arthritis, neuropathic and hysterical joints, the muscular dystrophies, and a number of other subjects. The paper, typography, illustrations and binding are excellent, and the bibliography and index are adequate.

It is an excellent practical reference work for the general surgeon or orthopedic specialist and a very complete, well-written, and abundantly illustrated textbook for students of all ages—a good, sensible, helpful book.

Davis: Neurosurgery

NEUROLOGICAL SURGERY. *By Loyal Davis, M.S., M.D., Ph.D., D.Sc. (Hon.), Professor of Surgery and Chairman of the Division of Surgery, Northwestern University Medical School, Chicago, Illinois. Illustrated with 172 Engravings and 2 Plates. Philadelphia: Lea & Febiger. 1936. Price, $6.00.*

Many physicians have an impression that there is little or no hope for patients with lesions of the nervous system, and therefore give a gloomy prognosis, which is neither sound nor accurate in the light of recent advances in neurologic diagnosis and surgery.

While it is not expected that the general practitioner will attempt to operate upon the nervous system, this book is intended especially for him, its purpose being to give him, in clear and precise language, those facts upon which he may base an intelligent diagnosis and which will enable him to give his patient helpful advice regarding surgical measures which may improve his condition. The details of operative technics will be of great value to neurosurgeons. The style of writing is clear and lucid and the bookwork and illustrations are beyond adverse criticism. It will be a worthwhile addition to any medical library.

Thomson-Walker and Walker: Surgical Urology

SURGICAL DISEASES AND INJURIES OF THE GENITO-URINARY ORGANS. *By Sir John Thomson-Walker, D.L., M.B., C.M.Ed., F.R.C.S.Eng., Consulting Urologist and Emeritus Lecturer on Urology, King's College Hospital; Consulting Surgeon, St. Peter's Hospital, etc. Second Edition, Revised. Edited by Kenneth Walker, M.A., M.B., B.C. (Cantab.), F.R.C.S.Eng. With 25 Color and 33 Black-and-White Plates, and 283 Illustrations in the Text. Baltimore: William Wood and Company. 1936. Price, $10.00.*

Sir John Thomson-Walker is one of the best known British urologists and is highly esteemed in America. His fame as a teacher is wide, and the greater part of this large and splendidly made volume is his work, the editing of this second edition of the book and the writing of four new chapters, on Renal Function Tests, Trans-urethral Prostatic Resection, Obstruction of the Bladder Neck, and Impotence and Sterility, having been the contribution of the junior author. The sections on prostatic enlargement, renal tuberculosis, and bladder tumors have been entirely rewritten, and other important and valuable changes have been made. The drawings, photographs and, especially, the 25 color plates are peculiarly helpful.

This is a modern and inclusive text and reference work on operative urology, which will be indispensable to all specialists in this field and of great service to general practitioners, by giving them a clear idea of what they can expect for their patients when they are referred to an up-to-date urologist.

Jutte: Meat in the Diet

YOU MUST EAT MEAT. Fancies, Foibles and Facts about Meat. *By Max Ernest Jutte, M.D., Formerly Lecturer on Stomach and Intestinal Diseases, New York Polyclinic Medical School, etc. New York: G. P. Putnam's Sons. 1936. Price, $2.00.*

In these days, when vegetarian and fruit diets are so popular, it requires courage on the part of a writer to plead the cause of meat as an essential part of the human diet.

In this attractively made little volume, the author has set forth a number of facts which are usually overlooked by the dietary faddists and cultists, and has done so in language so simple and direct that any intelligent high-school graduate can follow the logic of his argument. It should, therefore, be helpful in combating many of the widely current misconceptions.

Dr. Jutte believes—and gives ample reasons for his belief—that most chronic diseases are due largely to excessive fermentation of the starches and sugars contained in the diet, and presents sound and commonsense suggestions regarding the diet of a normal human being.

While this is a book intended for laymen, most physicians can read it with great profit and, if they will put its suggestions into practice with their patients, will be more successful. It may safely be recommended to intelligent patients who suffer from digestive or chronic diseases.

Spicer: Endotoxic Infections

THE ENDOTOXIC INFECTIONS AND THEIR CONTROL WITH EDWENIL. *Tenth Edition, Third Revision, Fiftieth Thousand. Glendale, California: Spicer and Company. 1936. Price, paper bound copy free on request.*

The fifth edition of this interesting and valuable book on immunology and immunotherapy was reviewed in the May, 1935, edition of this Journal, on page 261. All that was then said of it is still true, and more also, for this tenth edition has been completely revised for the third time, with the addition of much new and valuable material. It now contains 174 pages (34 more than the fifth and 74 more than the first). The elements of immunology are clearly and briefly sketched and much practical clinical material is included. Every practicing clinician should have a copy and study it.

MEDICAL NEWS

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Fifty Years in Practice

THE first native daughter of California to be licensed as a practicing physician is **Dr. Marie Antoinette Bennette**, of San Bernardino, whose picture appears above, and who is this year celebrating the golden anniversary of her licensure. She was born in 1858; graduated from Cooper Medical College, San Francisco, in 1885; and was licensed in 1886. During her professional career she has attended more than 2,000 confinements, and though, at the age of 78 years, she is taking things a bit easier than formerly, she is by no means ready to retire and is seeing patients regularly. She is a member of the A.M.A. and its constituent societies.

Women Physicians

WOMEN are relative newcomers in the medical profession. Last June, England celebrated the centenary of the birth of the first woman physician in that country, Dr. Elizabeth Garrett Anderson.

Suction Tonsillectomy Clinic

THE suction method of performing tonsillectomy, devised by Dr. J. B. H. Waring, (see CLIN. MED. & SURG., Oct., 1931, page 722) is exciting increasing interest. At a clinic, held in Chicago August 17 and 18, 1936, the advantages of this method over enucleation with a knife were shown by contrast. Physicians from five states were in attendance. Additional clinics will be held at the request of physicians. Those desiring information should write to Dr. Waring, at Wilmington, Ohio.

Service for Medical Writers

THE American Medical Editors' and Authors' Association is eager to bring about a closer relationship between authors and publishers. The Director wishes to announce that articles on medical subjects may be submitted to him for editing and putting into shape for publication. This service will be rendered free of charge. If the manuscript submitted has any real value, it will be submitted, with the author's consent, to some medical journal in his neighborhood for publication.

It is sincerely to be hoped that medical men, particularly those who have hesitated to publish articles in the past, will take advantage of this offer. The author need not be a member of the Association.

Address all manuscripts to Dr. Harold Hays, Director of the American Medical Editors' and Authors' Association, 133 East 58th Street, New York City.

Concentrated Scarlet Fever Antitoxin

SCARLET fever antitoxin has not been widely used for the prophylaxis and treatment of that disease, because of the large quantity of the serum which had to be given and the severe reactions which frequently followed its use.

The National Drug Company has now produced an antitoxin so potent that 0.5 cc. contains an immunizing dose of 2,000 units, and the therapeutic dose of 6,000 units is only 1.5 cc. These injections are less painful than those of the less-concentrated antitoxins, and reactions are much less frequent.

Eugenic Sterilization

IN 1909, California legalized the sterilization of the physically and socially unfit, as represented by inmates of the State institutions. Up to the end of the past year (1935), 10,801 such persons have been sterilized in California.

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